

*** NOTICES ***

Japan Patent Office is not responsible for any damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original precisely.

2.**** shows the word which can not be translated.

3.In the drawings, any words are not translated.

Bibliography

(19) [Country of Issue] Japan Patent Office (JP)

(12) [Official Gazette Type] Open patent official report (A)

(11) [Publication No.] JP,2002-177504,A (P2002-177504A)

(43) [Date of Publication] June 25, Heisei 14 (2002. 6.25)

(54) [Title of the Invention] Game machine

(51) [The 7th edition of International Patent Classification]

A63F 7/02 315

312

320

[FI]

A63F 7/02 315 A

312 Z

320

[Request for Examination] Un-asking.

[The number of claims] 13

[Mode of Application] OL

[Number of Pages] 57

(21) [Filing Number] Application for patent 2000-382785 (P2000-382785)

(22) [Filing Date] December 15, Heisei 12 (2000. 12.15)

(71) [Applicant]

[Identification Number] 000144153

[Name] Sankyo Co., Ltd.

[Address] 6-460, Sakaino-cho, Kiryu-shi, Gumma-ken

(72) [Inventor(s)]

[Name] Ukawa Imperial edict 8

[Address] 1-164-5, Aioi-cho, Kiryu-shi, Gumma-ken

(72) [Inventor(s)]

[Name] Ishida **

[Address] 6-460, Sakaino-cho, Kiryu-shi, Gumma-ken Inside of Sankyo Co., Ltd.

(74) [Attorney]

[Identification Number] 100103090

[Patent Attorney]

[Name] Rock face Fuyuki (besides one person)

[Theme code (reference)]

2C088

[F term (reference)]

2C088 AA18 AA37 AA42 AA47 BA35 DA07 EA02 EA10 EB25 EB38 EB44 EB48 EB52
EB58 EB64 EB73 EB76

[Translation done.]

* NOTICES *

Japan Patent Office is not responsible for any
damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not
reflect the original precisely.

2.**** shows the word which can not be translated.

3.In the drawings, any words are not translated.

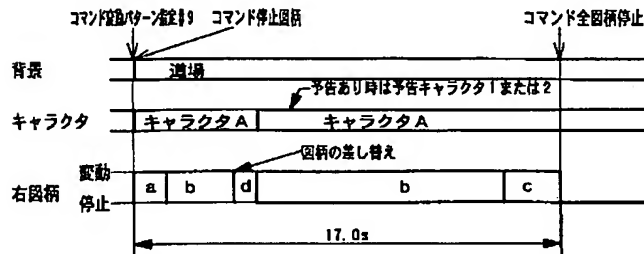
Summary

(57) [Abstract]

[Technical problem] Even if it was in the specific game state advantageous to a
game person, when it considers as the composition which prepares two or more
production control boards apart from game control means in the game machine with
which an adjustable display control is performed, the burden of the control about the
identification information display of game control means is made light.

[Means for Solution] CPU801 for display controls will determine using any of two or
more change patterns which indicate by adjustable for 17.0 seconds the right-and-
left pattern is indicated by adjustable, if change pattern specification #9 command is
received from CPU314 of the main substrate 310. And change operation and the
display of a character are performed according to the determined change pattern.
Moreover, CPU801 for display controls performs control on which a preliminary
announcement character is displayed [be / under / independent change operation /
of a right figure handle] hit / it], when performing a hit preliminary announcement is
determined. And a definite pattern is displayed after substituting a pattern before
the independent change operation start of a right figure handle so that a pattern
may be decided in the halt pattern notified from the main substrate 310.

[Translation done.]



[Translation done.]

* NOTICES *

Japan Patent Office is not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] On condition that the specific display result beforehand defined as a display result in the adjustable display concerned was displayed including the adjustable display which can adjustable display identification information During the period which a right generating state is made to occur and is in the right generating state concerned It is based on the game sphere having been detected by the starting detection means prepared in the starting field. The game control means which are game machines controllable to the 1st state advantageous to a game person from the 2nd state disadvantageous for a game person about adjustable winning-a-prize equipment, and control advance of a game, It has a display-control means to control the display state of the aforementioned adjustable display. the aforementioned game control means A contents determination means of a display to determine at least the adjustable display time of the identification information in the aforementioned adjustable display, and the definite identification information decided as a display result, A command output means to output the control command for controlling the aforementioned adjustable display to the aforementioned display-

control means is included. the aforementioned command output means It is based on the determination of the aforementioned contents determination means of a display. the adjustable viewing command which can specify the adjustable display time of identification information at least as the aforementioned control command, and the identification information specification command which can specify the aforementioned definite identification information The game machine characterized by an output being possible at the time relevant to starting adjustable presenting of identification information based on the aforementioned adjustable viewing command, and an output of the definite command which shows decision of identification information at the time relevant to terminating an adjustable display being possible.

[Claim 2] An adjustable display is a game machine according to claim 1 which outputs the identification information specification command corresponding to each of the viewing area of the aforementioned plurality [control means / game] while having two or more viewing areas and an adjustable display of identification information being possible in each viewing area.

[Claim 3] A display-control means is a game machine according to claim 1 or 2 which checks of which classification it is control command according to the classification information which shows the classification of the aforementioned control command, and judges at least whether they are an adjustable viewing command, an identification information specification command, and a definite command including the classification information the control command which game control means output indicates the classification of control command to be at least.

[Claim 4] A display-control means is the claim 1 which determines the contents of a display of 1 from two or more kinds of different contents of a display according to the adjustable viewing command of 1, and controls the display state of an adjustable display, or a game machine according to claim 3.

[Claim 5] The claim 1 which makes a right generating state occur when a game sphere is detected in the special field detection means which the specific display result beforehand set to the adjustable display was drawn, and was specially prepared in the field, or a game machine according to claim 4.

[Claim 6] The 1st guidance operation which can guide a game sphere to a field specially according to the display result of an adjustable display, or a game machine including a different guidance operation means from the aforementioned special field which can usually be guided to a field by which a game sphere can be guided in either of the 2nd guidance operation according to claim 5.

[Claim 7] Usually, the game machine according to claim 6 which repealed detection by the field detection means specially, and the guidance operation means confirmed in the period which is performing 1st guidance operation at least.

[Claim 8] The period which is performing the aforementioned adjustable display at least while starting adjustable presenting of identification information including the operating space which can pass a game sphere, and the operation detection means prepared in this operating space, on condition that the game sphere was detected by

the aforementioned operation detection means, and the period the guidance operation means is carrying out guidance operation are the game machine according to claim 6 carried out detection by the aforementioned operation detection means as it is invalid.

[Claim 9] The claim 6 characterized by providing the following, or a game machine according to claim 8 The operating space which can pass a game sphere the cover which, as for the period which is performing the aforementioned adjustable display at least, and the period which the guidance operation means is performing in guidance operation, a game sphere is made not to be led to the aforementioned operating space while starting adjustable presenting of identification information including the operation detection means prepared in this operating space, on condition that the game sphere was detected by the aforementioned operation detection means -- a member

[Claim 10] The game machine according to claim 5 judge that is unusual when there is no detection of a field detection means specially, in spite of having displayed the specific display result on the adjustable display.

[Claim 11] Usually, the game machine according to claim 6 with which an eccrisis detection means by which the game sphere guided to the field was detectable was established.

[Claim 12] The electrical part for production which was prepared in the game machine unlike the adjustable display, and the production control means for controlling this electrical part for production are included. game control means While outputting the production start command for making the auxiliary production performed corresponding to adjustable presenting of the identification information in the aforementioned adjustable display start using the aforementioned electrical part for production to the aforementioned production control means The aforementioned production control means can control the aforementioned electrical part for production based on the inputted production start command, and it sets in the right generating state. The aforementioned game control means are the claim 1 which does not output the aforementioned production start command corresponding to the adjustable display concerned to the aforementioned production control means even if it is the case where adjustable presenting of identification information is performed in the aforementioned adjustable display, or a game machine according to claim 11.

[Claim 13] The electrical part for production which was prepared in the game machine unlike the adjustable display, and the production control means for controlling this electrical part for production are included. game control means While outputting the production start command for making the auxiliary production performed corresponding to adjustable presenting of the identification information in the aforementioned adjustable display start using the aforementioned electrical part for production to the aforementioned production control means The aforementioned production control means can control the aforementioned electrical part for production based on the inputted production start command, and it sets in the right

generating state. The aforementioned production control means are the claim 1 which does not start auxiliary production based on the production start command concerned even if the aforementioned production start command is inputted, or a game machine according to claim 11.

[Translation done.]

*** NOTICES ***

Japan Patent Office is not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to game machines, such as a pachinko game machine with which a game is performed according to operation of a game person. Perform the adjustable display as derivation operation of identification information, and a right generating state is made to occur especially, on condition that the specific display result defined beforehand was drawn as a display result. When detection by the predetermined detection means is during the period which is in the right generating state concerned, it is related with the game machine with which grant of predetermined game value is attained.

[0002]

[Description of the Prior Art] As a game machine, game media, such as a game sphere, are discharged to a game field with a launcher, and when a game medium wins a prize of winning-a-prize fields, such as a winning-a-prize mouth prepared in the game field, there are some which the awarded balls of a predetermined individual pay out to a game person. Moreover, the adjustable display from which a display state can change is prepared, and when the display result of an adjustable display becomes the specific display mode defined beforehand and a game sphere wins a prize of a specific field, there are some which give game value (right for being in an advantageous state) to a game person. The inside of this right generating state will be in the state where a large winning-a-prize mouth can be opened. When a game

sphere wins a prize of the predetermined 3rd-sort starting mouth and is detected by the 3rd-sort starting detection means in a right generating state, a large winning-a-prize mouth is made into an open state, and it is constituted so that predetermined game value (advantageous state) may be given to a game person. Generally such a pachinko game machine is called 3rd sort pachinko game machine.

[0003] Game value is with a bird clapper at the state where generating the right for the state of adjustable winning-a-prize sphere equipment prepared in the game field of a game machine being in a state advantageous to the advantageous state for a game person where a hit ball tends to win a prize, for a bird clapper and a game person, and the conditions of premium game medium expenditure become easy to be satisfied. Moreover, when the game sphere and coin of the specified quantity are given or a score is added according to predetermined condition formation of winning a prize etc., they will be called value or valuable value.

[0004] a specific combination and the specific bird clapper of a display mode as which the display result of the adjustable display which displays a pattern (identification information) was beforehand determined in the 3rd sort pachinko game machine -- usually -- per ["] -- " -- ** -- it says If a hit occurs, a game medium will be led to a predetermined winning-a-prize mouth, and the right for considering as a great success game state will be given by making a game medium win a prize of the winning-a-prize mouth, for example. When the game person who acquired the right performs a predetermined game, it shifts to the great success game state where a specific adjustable winning-a-prize mouth carries out number-of-times opening of predetermined, and a hit ball tends to win a prize. And in each open period, if winning a prize to the specific adjustable winning-a-prize mouth of a predetermined individual (for example, ten pieces) is, a specific adjustable winning-a-prize mouth will be closed. And as long as the right is continuing, it shifts to a great success game state by performing a predetermined game again. Continuation of a right disappears, when the number of times of opening of a specific adjustable winning-a-prize mouth finishes the number of times of predetermined (for example, 16 rounds). In addition, a released time (for example, 10 seconds) is decided about each opening, and if a released time passes even if the number of winning a prize does not reach a predetermined individual, a specific adjustable winning-a-prize mouth will be closed. In addition, when operation which generates a right again during continuation of a right is performed, the right disappears.

[0005] Moreover, in the stage where a derivation indication of the part of the display results of two or more adjustable display is not yet given among the combination of the display mode of "" other than the combination of hit" is a gap", the state of fulfilling the display conditions from which the display mode of the adjustable display with which a derivation indication of the display result is already given serves as combination of a specific display mode is called "reach." A game person performs a game, enjoying how it is made to generate and a right is made to continue or how great success is generated.

[0006] The game advance in the 3rd sort pachinko game machine is controlled by the game control means by the microcomputer etc. Game control means perform control of the whole game, such as voice output control of control of emitters, such as a display control of adjustable display besides advance of a game, and a lamp, a loudspeaker, etc.

[0007]

[Problem(s) to be Solved by the Invention] However, if it is the composition to which the mode of adjustable presenting of the identification information displayed on adjustable display is crossed variably, the capacity of the program about an adjustable display control will become large. Therefore, it is difficult to control the identification information displayed on adjustable display by the microcomputer of the game control means which have a limit in program capacity.

[0008] Then, although it is thought a best policy to use the microcomputer other than the microcomputer of game control means for display controls (display-control means), game control means need to transmit the command for a display control to a display-control means in this case. Although what is necessary is for a display-control means just to be made to perform generation of image data, such as identification information, it is desirable that game control means are determined from a viewpoint that it is better for the game control means of the identification information under change in a screen by which the display position of **** sometimes controls advance of a game to carry out.

[0009] Although it is possible that game control means determine the display position of identification information for every suitable timing, and transmit a display position to a display-control means from the above-mentioned thing, in this case, the burden of the control about the identification information display of game control means becomes large, and it has the technical problem that the processing time which can be spent because of other game control is restricted. In order to solve such a technical problem, for example, game control means transmit the speed change time (a change start and a change halt are included) of identification information to a display-control means. Since a command is repeatedly transmitted to a display-control means from game control means during one change even if it is the case where determining the display position of identification information according to the speed which the display-control means received is considered however carried out in this way Too, the burden of the control about the identification information display of game control means is large.

[0010] In the 3rd sort pachinko game machine, since control about an identification information display is performed even if it is among a right generating state, if the burden of the control about an identification information display is large, the contents of production controllable in the right generating state will be restricted.

[0011] Even if this invention was in the specific game state advantageous to a game person, when it considers as the composition which prepares two or more production control boards apart from game control means in the game machine with

which an adjustable display control is performed, it aims at offering the game machine which can make light the burden of the control about the identification information display of game control means.

[0012]

[Means for Solving the Problem] The game machine by this invention contains the adjustable display which can adjustable display identification information. the specific display result (the game machine which performs pattern change based on predetermined detection --) beforehand defined as a display result in the adjustable display concerned a concept including the specific display result in the game machine which continues pattern change and is made to stop a pattern only at the time of decision -- it is, on condition that it was displayed During the period which a right generating state is made to occur and is in the right generating state concerned It is based on the game sphere having been detected by the starting detection means prepared in the starting field. The game control means which are game machines controllable to the 1st state advantageous to a game person from the 2nd state disadvantageous for a game person about adjustable winning-a-prize equipment, and control advance of a game, It has a display-control means to control the display state of an adjustable display. game control means A contents determination means of a display to determine at least the adjustable display time of the identification information in an adjustable display, and the definite identification information decided as a display result, A command output means to output the control command for controlling an adjustable display to a display-control means is included. a command output means It is based on the determination of the contents determination means of a display. The adjustable viewing command which can specify the adjustable display time of identification information at least as control command (For example, a change pattern command) and the identification information specification command which can specify definite identification information It is characterized by an output being possible at the time relevant to starting adjustable presenting of identification information based on an adjustable viewing command, and an output of the definite command which shows decision of identification information at the time relevant to terminating an adjustable display being possible.

[0013] It has two or more viewing areas, and while an adjustable display of identification information is possible for an adjustable display in each viewing area, it may be considered as the composition to which game control means output the identification information specification command corresponding to each of two or more viewing areas.

[0014] Including the classification information (for example, MODE data) the control command which game control means output indicates the classification of control command to be at least, a display-control means checks of which classification it is control command according to the classification information which shows the classification of control command, and it may be constituted so that it may judge at

least whether they are an adjustable viewing command, an identification information specification command, and a definite command.

[0015] A display-control means determines the content of a display of 1 from two or more kinds of different contents of a display according to the adjustable viewing command of 1, and it may be constituted so that the display state of an adjustable display may be controlled.

[0016] When a game sphere is detected in the special field detection means which the specific display result beforehand set to the adjustable display was drawn, and was specially prepared in the field, you may consider as the composition which makes a right generating state occur.

[0017] It may be constituted so that it may carry out including the 1st guidance operation which can guide a game sphere to a field specially, or a specially different guidance operation means from a field which can usually be guided to a field by which a game sphere can be guided in either of the 2nd guidance operation, according to the display result of an adjustable display.

[0018] Usually, detection by the field detection means is repealed specially, and the guidance operation means may be considered as the composition confirmed in the period which is performing 1st guidance operation at least.

[0019] On condition that the game sphere was detected by the operation detection means, while starting adjustable presenting of identification information including the operating space which can pass a game sphere, and the operation detection means prepared in the operating space, the period which is performing the adjustable display at least, and the period which the guidance operation means is performing in guidance operation may be considered as the composition carried out detection by the operation detection means as it is invalid.

[0020] On condition that the game sphere was detected by the operation detection means, while starting adjustable presenting of identification information including the operating space which can pass a game sphere, and the operation detection means prepared in the operating space, the period which is performing the adjustable display at least, and the period which the guidance operation means is performing in guidance operation may be considered as the composition prepare the covered member by which a game sphere is made not to be led to an operating space.

[0021] In spite of having displayed the specific display result on the adjustable display, when there is no detection of a field detection means specially, it may be constituted so that it may judge with it being unusual.

[0022] Usually, it is good also as composition which establishes an eccrisis detection means by which the game sphere guided to the field is detectable.

[0023] The electrical part for production which was prepared in the game machine unlike the adjustable display, and the production control means for controlling the electrical part for production are included. game control means While outputting the production start command (for example, change pattern command) for making the auxiliary production performed corresponding to adjustable presenting of the

identification information in an adjustable display start using the electrical part for production to production control means Production control means can control the electrical part for production based on the inputted production start command, and it sets in the right generating state. Even if it is the case where adjustable presenting of identification information is performed in an adjustable display, game control means may be constituted to production control means so that the production start command corresponding to the adjustable display concerned may not be outputted.

[0024] The electrical part for production which was prepared in the game machine unlike the adjustable display, and the production control means for controlling the electrical part for production are included. game control means While outputting the production start command for making the auxiliary production performed corresponding to adjustable presenting of the identification information in an adjustable display start using the electrical part for production to production control means Production control means can control the electrical part for production based on the inputted production start command, and it sets in the right generating state. Even if a production start command is inputted, production control means may be constituted so that auxiliary production may not be started based on the production start command concerned.

[0025]

[Embodiments of the Invention] Hereafter, 1 operation gestalt of this invention is explained with reference to a drawing. First, the composition of the whole pachinko game machine which is an example of a game machine is explained. With the gestalt of this operation, if the halt pattern of the pattern by which it is indicated by adjustable based on starting passage serves as combination of a predetermined pattern and a game sphere is detected by the predetermined detection means, a predetermined right will explain the pachinko game machine (the 3rd sort pachinko game machine) generated or continued. The front view with which drawing 1 saw the pachinko game machine 1 from the transverse plane, and drawing 2 are the front view which saw the game board 6 of a pachinko game machine from the transverse plane. The game board 6 is attached in the main part of the pachinko game machine 1 removable.

[0026] First, the whole pachinko game machine 1 composition is explained with reference to drawing 1 and drawing 2 . The pachinko game machine 1 has the glass door frame 2 formed in the shape of a frame. The hit ball supply pan 3 is shown in the lower front face of the glass door frame 2. The hit ball operation handle (operating knob) 5 which discharges the surplus sphere saucer 4 which stores the reservoir sphere with which it overflowed from the hit ball supply pan 3, and a hit ball is formed in the lower part of the hit ball supply pan 3. Behind the glass door frame 2, the game board 6 is attached removable. Moreover, the game field 7 is established in the front face of the game board 6. Two loudspeakers 29 which emit a sound effect are formed in the right-and-left upper part of the outside of the game

field 7. The game effect lamps 30a-30c are formed in the periphery of the game field 7. Furthermore, it is adjoined and installed in the pachinko game base 1 by drawing 1, and the card unit 31 which makes a sphere loan possible is also shown to it by inserting a prepaid card.

[0027] The adjustable display 8 containing the adjustable drop (judgment pattern drop) 9 by LCD (liquid crystal display) for indicating the judgment pattern by adjustable is formed near the central upper part of the game field 7. With the gestalt of this operation, two pattern display area, the "left" and the "right", is shown in the adjustable drop 9. In addition, you may make it pattern display area have the area of other numbers (three [for example,], the "left", "inside", and the "right").

Moreover, sphere detection effective lamp 11a and sphere detection invalid lamp 11b are prepared in the upper part of the adjustable display 8.

[0028] The common adjustable winning-a-prize equipment 12 which performs switching action is formed near the center of the game field 7. The game sphere which usually won a prize of adjustable winning-a-prize equipment 12 is detected by the sphere pilot switch 13. In addition, if a game sphere is detected by the sphere pilot switch 13, five awarded balls will pay out, for example. The guide 14 which guides the game sphere which fell in the predetermined guidance hole of a guidance field to distribution equipment 15 is usually formed in the lower part of adjustable winning-a-prize equipment 12. The distribution equipment 15 with which the game sphere guided with the guide 14 is led to the lower part of a guide 14 is formed. Operation of adjustable winning-a-prize equipment 12, a guide 14, and distribution equipment 15 is usually explained in detail later.

[0029] On the right-hand side of adjustable winning-a-prize equipment 12, body of revolution 16 is usually arranged. It has the tie-down plate attached in the front face of the game board 1, an envelopment frame protrudes on the front face of the tie-down plate, and body of revolution 16 is making the structure by which a rotation drive is carried out in the direction of a clockwise rotation by the motor 62 (refer to drawing 8) inside an envelopment frame. The **** crevice 17 in which one hit ball is accepted is formed in the periphery section of body of revolution 16. The **** crevice 17 is considered as the composition which can accept the hit ball which entered from the starting winning-a-prize mouth 18 which body of revolution 16 rotates and is formed in the upper part of an envelopment frame. The hit ball caught by the **** crevice 17 is led to the tooth back of a tie-down plate, and is detected by the starting sphere pilot switch 19. The great success state where open control of the large winning-a-prize mouth mentioned later is carried out because the starting sphere pilot switch 19 detects a hit ball in a right generating state comes to occur. In addition, if a game sphere is detected by the starting sphere pilot switch 19, five awarded balls will pay out, for example. The opening-and-closing board 20 made into an open state is formed in the great success game state at the lower part of body of revolution 16. With the gestalt of this operation, the opening-and-closing board 20 serves as a means to open and close a large winning-a-prize mouth. The

winning-a-prize sphere led to the tooth back of the game board 6 from the opening-and-closing board 20 is detected by the count switch 21. In addition, if the count switch 21 detects a game sphere, 15 awarded balls will pay out, for example.

[0030] In the game board 6, the adjustable winning-a-prize operation mouth 22 is usually formed, and it is detected by common adjustable winning-a-prize operation switch of game sphere usually prepared by winning a prize to adjustable winning-a-prize operation mouth 22 corresponding 22a. If a game sphere is usually detected by adjustable winning-a-prize operation switch 22a, five awarded balls will pay out, for example. Moreover, in the game board, two or more winning-a-prize mouths (general winning-a-prize mouth) 23-26 are formed, and winning a prize to each winning-a-prize mouth 23-26 of a game sphere is detected with the winning-a-prize mouth switches 23a-26a formed by corresponding. If a game sphere is detected by any of the winning-a-prize mouths 23-26 they are, 15 game spheres will pay out, for example. The winning-a-prize lamps 22b-26b are usually formed in the adjustable winning-a-prize operation mouth 22 and each winning-a-prize mouths 23-26, respectively. On the outskirts of right and left of the game field 7, the side lamp 27 by which it is indicated by blink is formed into a game, and there is an out mouth 28 which absorbs the hit ball which did not win a prize in the lower part.

[0031] Drawing 3 is explanatory drawing for [which usually explains the structure of adjustable winning-a-prize equipment 12, a guide 14, and distribution equipment 15] being prepared in the game board 6. In addition, the predetermined internal field of adjustable winning-a-prize equipment 12, a guide 14, and distribution equipment 15 is usually called specific field. The pieces 32a and 32b of opening and closing of the right-and-left couple usually prepared in adjustable winning-a-prize equipment 12 if usually detected by adjustable winning-a-prize operation switch 22a in which the hit ball hammered out by the game field 7 usually wins a prize of the adjustable winning-a-prize operation mouth 22, and is prepared by corresponding will be in the tilting state which carries out predetermined-time opening about the specific winning-a-prize mouth 33 based on the drive of a solenoid 60 (refer to drawing 8). If the pieces 32a and 32b of opening and closing are made into a tilting state and a game sphere wins a prize of the specific winning-a-prize mouth 33, after a winning-a-prize sphere is detected by the sphere pilot switch 13 prepared in the entrance of a specific field, it will be led to a guide 14. The game sphere led to the guide 14 flows down the guidance field 34 in a guide 14, and results in 3 hole KURUN 35. Three guidance holes 36a-36c for dropping a game sphere are formed in 3 hole KURUN 35. In this example, the game sphere which fell to guidance hole 36a prepared in a part for a center section is guided to distribution equipment 15, and the game sphere which fell in other two guidance holes 36b and 36c is making the structure discharged from the posterior part of the game board 6. The game sphere which fell in the guidance holes 36b and 36c is detected by the eccrisis switch which is formed in the posterior part of the game board 6 and which is not illustrated. In this example, the distribution equipment 15 with which the game sphere guided with the guide 14

is led to the lower part of a guide 14 is formed.

[0032] 3 hole KURUN 35 of a guide 14 has the role which prevents that two or more game sphere besides [which casts lots in the game sphere guided to distribution equipment 15] a role will be continuously led to distribution equipment 15. When two or more game spheres are continuously led to distribution equipment 15, there is a possibility that a game sphere may be led succeeding the pattern operation switch 38 mentioned later. In order to prevent such a thing, 3 hole KURUN 35 of a guide 14 is formed so that a game sphere may pile up in a dished upside portion for a while, and when two or more game spheres fall in the same guidance hole (any of the guidance holes 36a-36c are they?), it is made into the structure where one game sphere falls at a time one by one.

[0033] the game sphere which fell to guidance hole 36a of 3 hole KURUN 35 is led to distribution equipment 15 -- having -- cover -- if a member 37 is not in a cover state, it will be caught by sphere receptacle crevice 39a which receives one game sphere with which the flare-part material 39 is equipped after being detected by the pattern operation switch 38. With the gestalt of this operation, since it is made to detect the game sphere which passed the passage mouth with which the pattern operation switch 38 is formed, it considers as the structure where a game sphere does not stay in the passage mouth of the pattern operation switch 38. Therefore, incorrect detection of a game sphere can be prevented so that a game sphere may fluctuate and multiple-times detection may not be carried out within the pattern switch 38. If the pattern operation switch 38 detects the passed game sphere, the pattern displayed on the pattern display area of the adjustable drop 9 will start rotation. Rotation of the picture in the adjustable drop 9 stops, when fixed time passes. The combination of the picture at the time of a halt hits, and the flare-part material 39 starts a RRC by the drive of the motor 63 (refer to drawing 8) formed in the tooth back of the game board 6 as it is the combination of a pattern. If the flare-part material 39 carries out the RRC, the game sphere caught by sphere receptacle crevice 39a will be wide opened from a stay state, and will be guided to V winning-a-prize mouth (specially field) 40. Then, the game sphere led to V winning-a-prize mouth 40 is detected by V winning-a-prize switch 41, and will be in a right generating state.

[0034] If a hit ball wins a prize of the **** crevice 17 of body of revolution 16 and makes the starting sphere pilot switch 19 turn on while the right generating state is continuing, a great success state will occur and predetermined-time opening of the large winning-a-prize mouth will be carried out. It shifts to a great success game state. That is, it opens until the opening-and-closing board 20 carries out fixed time progress, or until the hit ball of the predetermined number (for example, ten pieces) wins a prize. And a great success state is repeated, whenever a hit ball will win a prize of the **** crevice 17 of body of revolution 16 and will be detected by the starting sphere pilot switch 19, if the right generating state is continuing. However, continuation of a right generating state is ended by having detected the winning-a-

prize sphere of the predetermined number (for example, 16 pieces) in the starting sphere pilot switch 19, when a hit ball is again detected by V winning-a-prize switch 41 in a right generating state.

[0035] in addition, the cover which drives the game sphere which fell to 3 hole KURUN 35's at guidance hole 36a, and was led to distribution equipment 15 by the solenoid 61 (refer to drawing 8) -- when a member 37 is in a cover state, it is led to exhaust ports 42a and 42b, and is discharged from the posterior part of the game board 6. In addition, the game sphere discharged from exhaust ports 42a and 42b is detected by the eccrisis switch which is formed in the posterior part of the game board 6 and which is not illustrated. Moreover, the flare-part material 39 starts a RLC by the drive of the motor 63 which the combination of the picture at the time of a halt in the adjustable drop 9 hits, and is formed in the tooth back of the game board 6 if it is not the combination of a pattern. If the flare-part material 39 carries out the RLC, the game sphere caught by sphere receptacle crevice 39a will be wide opened from a stay state, and will be guided to an exhaust port (usually field) 43. Then, after the game sphere led to the exhaust port 43 is detected by the eccrisis switch 44, it is discharged from the posterior part of the game board 6.

[0036] In addition, with the gestalt of this operation, the stepping motor and rotary solenoid which are driven without solenoids (for example, solenoids 60 and 61 etc.) and a motor (for example, motors 62 and 63) being influenced by the power line period are used. Even if it is the area where it follows, for example, power line periods differ like East Japan and western part of Japan, it can be used normally as it is (without changing a setup etc.).

[0037] Moreover, with the gestalt of this operation, V winning-a-prize switch 41 is made into the effective state which during the period when rotation operation (here, it restricts to operation performed after the definite pattern which shows a hit is displayed) of the flare-part material 39 is performed can detect [of a game sphere] in order to prevent incorrect detection. therefore, for example, a game sphere -- opening -- rather than time until the after flare-part material 39 returns to the original position the bottom, after a game sphere is opened wide, the drive time of the flare-part material 39 etc. is set up so that the direction of time until it is detected by V winning-a-prize switch 41 may become short.

[0038] As mentioned above, the game sphere included in the specific field is detected by the sphere pilot switch 13 prepared in the entrance of a specific field. moreover, the game sphere which fell in the guidance holes 36b and 36c and cover -- the game sphere which fell to guidance hole 36a when a member 37 was in a cover state is detected by the eccrisis switch which is not illustrated. Furthermore, the game sphere led to the exhaust port 43 is detected by the eccrisis switch 44, and the game sphere led to V winning-a-prize mouth 40 is detected by V winning-a-prize switch 41. Thus, it considers as the composition with which all the game spheres that came out of the game sphere and the specific field included in the specific field are detected. If an error is reported when many directions of the game

sphere discharged rather than the game sphere which followed, for example, went into the specific field are detected, it will become possible to check the existence of a malfeasance. in addition, the game sphere which fell in the guidance holes 36b and 36c and cover -- when a member 37 is in a cover state, you may make it the same eccrisis switch (for example, eccrisis switch 44) detect the game sphere which fell to guidance hole 36a, and the game sphere led to the exhaust port 43

[0039] cover of the distribution equipment 15 mentioned above -- the member 37 is formed in order to prevent that two or more game spheres are continued and led to the pattern operation switch 38 The pattern operation switch 38 is considered as the composition which repeals detection of a game sphere until rotation operation of the flare-part material 39 after the definite pattern was displayed will be completed if a game sphere is detected in order to prevent incorrect detection (until it returns to the position of a dimension). Therefore, when the game sphere enables passage of the pattern operation switch 38 whose detection is invalid, there is a possibility of giving a game person etc. the misapprehension of a poor switch. cover -- the member 37 has the role which prevents the above evils by covering so that a game sphere may not be led to the pattern operation switch 38 during predetermined cover -- the time of a game sphere being detected by the pattern operation switch 38, as for a member 37 -- a shutter -- the front of the game field 7 -- a protrusion -- it will be in a cover state the bottom, and after rotation operation of the after flare-part material 39 is completed, it drives so that a shutter may be in the state contained inside the game board 6 where it does not cover in addition, cover -- a member 37 may be made to be made into predetermined period the state where it does not cover when there is detection by the sphere pilot switch 13 If it does in this way, it can prevent that will pass the pattern operation switch 38 after being in the power off state by power failure etc., and sphere receptacle crevice 39a will stay the game sphere which is not detected with the pattern operation switch 38.

[0040] in addition, cover of distribution equipment 15 -- the member 37 has also played the role which prevents that a right disappears during right generating after a right occurs for example, as a result of fluctuating a judgment pattern based on the pattern operation switch 38 having detected the game sphere in a right generating state, when the halt pattern in the adjustable drop 9 hits and it becomes a pattern The game sphere led to V winning-a-prize mouth 40 serves as what is detected by V winning-a-prize switch 41 (operation which generates a right again is performed), and the evil in which a right will disappear (the so-called "blowout") is caused. cover -- the member 37 has the role which also prevents the above evils by covering so that a game sphere may not be led to the pattern operation switch 38 during predetermined

[0041] As mentioned above, although considered as the composition to which the halt pattern of the adjustable drop 9 is in charge of, the flare-part material 39 will carry out a RRC if it is a pattern, the halt pattern of the adjustable drop 9 separates, and the flare-part material 39 will carry out a RLC if it is a pattern In this case, the

flare-part material 39 rotates to the position where the game sphere caught by sphere receptacle crevice 39a is opened wide. After a game sphere is opened wide, rotation of this direction is continued, and it rotates one time and you may make it rotate reversely, after opening a game sphere wide, make it return to the original position, and return to the original position. in addition, since it is desirable that it is less than 15 seconds until the game sphere wide opened from the flare-part material 39 is detected by V winning-a-prize switch 41 through a path, after the halt pattern of the adjustable drop 9 serves as a hit, as for the drive time of the flare-part material 39, it is desirable to be set up within 15 (for for example, hit/to be irrespective of a gap) seconds With the gestalt of this operation, the halt pattern of the adjustable drop 9 hits and comes out, and in a certain case, rather than time after the flare-part material 39 starts a drive, until a game sphere is opened wide, after a game sphere is opened wide, the drive time of the flare-part material 39 is set up so that the direction of time until it is detected by V winning-a-prize switch 41 through a path may become short. Therefore, in this example, when the flare-part material 39 and V winning-a-prize switch 41 are separated, the rotational speed of the flare-part material 39 is set up late, and is adjusted. In addition, the rotational speed (turnover time) of the flare-part material 39 may not be fixed, for example, you may make it turn into rotational speed in which the back before opening a game sphere differs from each other.

[0042] In addition, distribution equipment 15 is made into the structure where transparent covering is put and a game sphere cannot be taken in and out of the exterior in order to prevent a malfeasance etc. However, if the game sphere falls to guidance hole 36a of 3 hole KURUN 35 after a power supply is severed by power failure etc. for example, when the game sphere exists in the interior of a guide 14, it will be in the state where sphere receptacle crevice 39a stayed, without detecting a game sphere with the pattern operation switch 38. in such a case, since it comes out, and a game sphere cannot be taken out even if it is, the fault of being in the state [that sphere receptacle crevice 39a nevertheless stays a game sphere] where pattern change is not started after current supply resumption will arise As it is shown in drawing 4 in order to avoid such evil for example, it is good for transparent covering of the front face of the flare-part material 39 of distribution equipment 15 also as composition which forms a slit 45. The slit 45 is made into the longwise configuration so that the inserted rod can be moved up and down. Even if it is the case where sphere receptacle crevice 39a stays such composition, then the game sphere, without being detected by the pattern operation switch 38 After current supply resumes, a glass window frame is opened, a rod is inserted in the specific field of distribution equipment 15 through a slit 45, a game sphere is pushed up by putting a rod into the game sphere bottom and making it move to it up, and it can be detected by the pattern operation switch 38. Moreover, a game sphere is returned to the stay position in sphere receptacle crevice 39a by pulling out a rod. Thus, the fault can be canceled even if it is the case where the composition which

forms a slit 45 in distribution equipment 15, then the fault which causes trouble to a game arise.

[0043] moreover -- distribution equipment 15 -- the upper part of the pattern operation switch 38 -- cover -- although considered as the composition which forms a member 37, it is shown, for example in drawing 5 -- as -- the upper part of V winning-a-prize switch 41 -- cover -- it is good also as composition which forms a member 46 cover -- a member 46 is made into the state permit penetration of the game sphere to V winning-a-prize switch 41 until V winning-a-prize switch 41 detects the game sphere wide opened from from because the flare-part material 39 carries out a RRC, when the halt pattern of the adjustable drop 9 hits and it becomes a pattern and do not cover, and it is just made it being made into the cover state which forbids in penetration of the game sphere to V winning-a-prize switch 41 at the time of others cover -- a member 46 is driven by the solenoid which is not illustrated and is made into a cover state / state where it does not cover. cover -- as shown in drawing 5 , the upper surface is formed in the about V character type, and the member 46 is making the structure where the upper part stays the game sphere led when it is in a cover state when the power off which depends a power failure etc. occurs with the gestalt of this operation, before detection operation by V winning-a-prize switch 41 becomes invalid -- cover -- a member 46 is made into a cover state and a game state is backed up after that as a state where a game sphere is not led to V winning-a-prize switch 41 into a power off state In addition, backup processing of a game state is explained in detail later. and -- the case where the game sphere has been led after being in a power off state -- cover -- the state where the upper part of a member 46 stayed the game sphere -- becoming -- after power supply restoration -- cover -- a game sphere is detected by V winning-a-prize switch 41 by making a member 46 into the state where it does not cover Therefore, even when it changes into a power off state after the halt pattern turned into a pattern which shows a hit, it becomes possible to prevent giving a game person disadvantageous profit, without shifting to a right generating state. in addition, after power supply restoration -- immediately -- cover -- since a game sphere may have passed before detection operation by V winning-a-prize switch 41 becomes effective, if a member 46 is made into the state where it does not cover, after the switch processing in game control means was started -- cover -- it is made to make a member 46 into the state where it does not cover time [in this case,] a solenoid is off -- cover -- what is necessary is just to prepare separately the hard circuit for closing a shutter (it considering as a cover state), when it considers as the composition in which a member 46 will be in the state where it does not cover [0044] in addition, a hit of the flare-part material 39 -- working -- accepting it -- cover -- you may make it control so that a member 46 will be in the state where it does not cover with the gestalt of this operation, after a game sphere is wide opened from the flare-part material 39, since it is controlled so that the direction of time until the flare-part material 39 returns to the original position becomes long,

before hit operation of the flare-part material 39 is completed (cover -- before a member 46 is in a cover state), it is surely detected by V winning-a-prize switch 41 rather than time until it is detected by V winning-a-prize switch 41 when the halt pattern of the adjustable drop 9 becomes a hit, before [therefore,] a game sphere wins a prize of V winning-a-prize mouth 40 -- cover -- a member 46 -- a cover state -- becoming -- a game sphere -- cover -- as [stay / the upper part of a member 46]

[0045] In addition, although it was made to prevent that two or more game spheres will be continuously led to the pattern operation switch 38 by 3 hole KURUN 35 in the example mentioned above, you may make it prevent being led to a pattern operation switch in succession according to other structures. in this case, a guide 14 and cover -- the portion equivalent to a member 37 and the pattern operation switch 38 is shown in drawing 6 -- as -- the movable member 47 of a spring formula, and cover -- what is necessary is just to make it member 37a and pattern operation switch 38a constitute The movable member 47 is a member of the spring formula which returns to the original position according to the stability of a spring, when it will be in the inclination state shown in drawing 6 (B) from the level state shown in drawing 6 (A) by the weight of one game sphere and a game sphere is opened wide. cover -- a member -- it is made into a cover state in between [until 37a finishes a predetermined game from the time of pattern operation switch 38a detecting one game sphere /, such as etc., until it is decided whether it changed into the right generating state until a definite indication for example, of the change pattern was given --], and it is prepared in order to forbid the inflow of the game sphere to the direction of operation pilot-switch 38a and to make it flow into an exhaust port in the meantime In addition, the flare-part material 39 (not shown in drawing 6) is formed in the lower part of pattern operation switch 38a. Even if it is the case where it considers as such structure, it becomes possible to prevent that two or more game spheres will be continuously led in the direction of pattern operation switch 38a. For this reason, it is prevented that a right disappears immediately after a right occurs. Therefore, it can prevent giving a game person etc. the misapprehension of a poor switch.

[0046] In addition, although it was made to use the movable member 47 of a spring formula, you may make it use the movable member driven by the solenoid or the motor in other above-mentioned examples. In this case, a movable member will be in an inclination state from a level state by the weight of one game sphere, and will be returned to the original position by the drive of a solenoid or a motor to the predetermined timing after the game sphere was opened wide.

[0047] Next, the structure of the rear face of the pachinko game machine 1 is explained with reference to drawing 7 . At the tooth back of the adjustable display 8, as shown in drawing 7 , the sphere reservoir tank 49 is formed in the upper part of the mechanism board 48, and where the pachinko game machine 1 is installed in a game machine installation island, a game sphere is supplied to the sphere reservoir

tank 49 from the upper part. The game sphere in the sphere reservoir tank 49 results in sphere expenditure equipment through a guide 50.

[0048] The expenditure control board 370 in which the microcomputer for awarded-balls control which performs the relay substrate 52 for relaying the signal between the game control boards (the main substrate) 310, and the adjustable display-control units 51 and the game control boards 310 in which the adjustable display-control unit 51, a microcomputer for game control, etc. which control the adjustable drop 9 were carried, and expenditure control of a game sphere was carried is installed in the mechanism board 48. Furthermore, the ramp-control substrate 350 for sending a signal to the hit ball launcher 53 which discharges a hit ball to the game field 7 using the turning effort of a motor, and emitters, such as the game effect lamps 30a, 30b, and 30c, is installed in the lower part of the mechanism board 48.

[0049] Drawing 8 is the block diagram showing an example of the circuitry in the main substrate 310. In addition, the expenditure control board 370, the ramp-control substrate 350, the sound control board 700, the discharge control board 910, and the display-control substrate 800 are also shown in drawing 8. The basic circuit 311 which controls the pachinko game machine 1 in the main substrate 310 according to a program, The sphere pilot switch 13, the starting sphere pilot switch 19, the count switch 21, common adjustable winning-a-prize operation switch 22a, The switching circuit 316 which gives the signal from the winning-a-prize mouth switches 23a-26a, the pattern operation switch 38, V winning-a-prize switch 41, and the eccrisis switch 44 to the basic circuit 311, the solenoid 60 which opens and closes the pieces 32a and 32b of opening and closing, and cover -- with the solenoid circuit 317 which drives the solenoid 61 grade which performs cover / un-covering according to the instructions from the basic circuit 311 [of a member 37] The motor circuit 318 which drives the motor 63 grade used as the driving source of the motor 62 used as the driving source of body of revolution 16 or the flare-part material 39 according to the instructions from the basic circuit 311 is carried.

[0050] Moreover, the information output circuit 319 which outputs the great success information which shows generating of great success according to the data given from the basic circuit 311, the right generating information which shows that the right generating state arose to host computers, such as a hole management computer, is included.

[0051] The basic circuit 311 contains ROM312 which memorizes the program for game control etc., RAM313 which is an example of the storage means used as work memory, CPU314 which performs control action according to a program, and the I/O Port section 315. With the gestalt of this operation, ROM312 and RAM313 are built in CPU314. That is, CPU314 is 1 chip microcomputer. In addition, that, as for 1 chip microcomputer, RAM313 should just be built in at least, even if ROM312 and the I/O Port section 315 are external, they may be built in. Moreover, the I/O Port section 315 is a terminal in a microcomputer in which information I/O is possible.

[0052] Furthermore, the address decoding circuit 321 which outputs the signal for

decoding the address signal given to a power up from the system-reset circuit 320 and the basic circuit 311 for resetting the basic circuit 311 to the main substrate 310, and choosing the I/O Port of either of the I/O Port sections 315 as it is formed. In addition, although there is also switch information inputted into the main substrate 310 from sphere expenditure equipment 97, they are omitted in drawing 8.

[0053] The hit ball launcher which hits a game sphere and is discharged is driven with the drive motor 911 controlled by the circuit on the discharge control board 910. And the driving force of a drive motor 911 is adjusted according to the control input of an operating knob 912. That is, it is controlled by the circuit on the discharge control board 910 so that a hit ball is discharged at the speed according to the control input of an operating knob 912.

[0054] In addition, with the gestalt of this operation, the display control of winning-a-prize storage drop [which is formed in the game board 1] 10, sphere detection effective lamp 11a, and sphere detection invalid [the ramp-control means carried in the ramp-control substrate 350] lamp 11b, the winning-a-prize lamps 22b-26b, the side lamp 27, and the game effect lamps 30a-30c is performed. Here, a ramp-control means is an example of emitter control means. Moreover, the display control of the adjustable drop 9 of the adjustable display 8 which indicates the pattern by adjustable is performed by the display-control means carried in the display-control substrate 800.

[0055] Drawing 9 is the block diagram showing the circuitry in the display-control substrate 800 with the output ports (ports 0 and 2) 315A and 315C of the pattern drop (LCD drop) 9 and the main substrate 310, and output-buffer circuit 322,322A. From output port (output port 2) 315C, 8-bit data are outputted and a 1-bit strobe signal (INT signal) is outputted from output port 315A.

[0056] CPU801 for display controls will receive a display-control command through input-buffer circuit 805A, if it operates according to the program stored in control data ROM802 and an INT signal is inputted through a noise filter 807 and input-buffer circuit 805B from the main substrate 310. 74HC540 and 74HC14 which are general-purpose IC can be used as input-buffer circuits 805A and 805B. In addition, when CPU801 for display controls does not build in the I/O Port, an I/O Port is prepared between the input-buffer circuits 805A and 805B and CPU801 for display controls.

[0057] And CPU801 for display controls performs the display control of the screen displayed on the adjustable drop 9 according to the received display-control command. Specifically, the instructions according to the display-control command are given to VDP(video display processor) 803. VDP803 reads required data from a character ROM 804. VDP803 generates the image data for displaying on the adjustable drop 9 according to the inputted data, and outputs R, G, B signal, and a synchronizing signal to the adjustable drop 9.

[0058] In addition, the character ROM 804 which stores the oscillator circuit 809 for giving a clock of operation to the reset circuit 808 for resetting VDP803 and

VDP803 and image data with high operating frequency in drawing 9 is shown. The image data with the high operating frequency stored in a character ROM 804 is a picture which consists of the person and animal which are displayed on the adjustable drop 9 or a character, a figure, or a sign.

[0059] The input-buffer circuits 805A and 805B can pass a signal only in the direction which goes to the display-control substrate 800 from the main substrate 310. Therefore, there is no room to transmit a signal from the display-control substrate 800 side to the main substrate 310 side. That is, the input-buffer circuits 805A and 805B constitute an irreversible information input means with input port. Even if unjust reconstruction is added to the circuit in the display-control substrate 800, the signal outputted by unjust reconstruction does not get across to the main substrate 310 side.

[0060] In addition, although the output of output ports 315A and 315C may be outputted to the display-control substrate 800 as it is, signal transduction of one directivity from the main substrate 310 to the display-control substrate 800 can be made more reliable by preparing output-buffer circuit 322,322A in which signal transduction is possible only in an one way. Namely, as for output-buffer circuit 322,322A, an output port constitutes an irreversible information output means.

[0061] Moreover, as a noise filter 807 which intercepts a RF signal, although for example, 3 terminal capacitor and a ferrite bead are used, though a noise rides on a display-control command between substrates, the influence is removed by existence of a noise filter 807. In addition, you may prepare a noise filter also in the output side of buffer circuit 322,322A of the main substrate 310.

[0062] Drawing 10 is the block diagram showing the signal transceiver portion in the main substrate 310 and the ramp-control substrate 350. With the gestalt of this operation, the ramp-control command which shows lighting/putting out lights of sphere detection effective lamp 11a, sphere detection invalid lamp 11b, the winning-a-prize lamps 22b-26b, the side lamp 27, and the game effect lamps 30a-30c is outputted to the ramp-control substrate 350 from the main substrate 310. Moreover, the ramp-control command which shows the lighting number of the winning-a-prize storage drop 10 is also outputted to the ramp-control substrate 350 from the main substrate 310.

[0063] As shown in drawing 10, the ramp-control command about ramp control is outputted from the output ports (output ports 0 and 3) 315A and 315D of the I/O Port section 315 in the basic circuit 311. Output port (output port 3) 315D outputs 8-bit data, and output port 315A outputs a 1-bit INT signal. In the ramp-control substrate 350, the control command from the main substrate 310 is inputted into CPU351 for ramp control through the input-buffer circuits 355A and 355B. In addition, when CPU351 for ramp control does not build in the I/O Port, an I/O Port is prepared between the input-buffer circuits 355A and 355B and CPU351 for ramp control.

[0064] In the ramp-control substrate 350, CPU351 for ramp control outputs

lighting/putting-out-lights signal according to lighting/putting-out-lights pattern of the winning-a-prize storage drop 10 defined according to each control command, sphere detection effective lamp 11a, sphere detection invalid lamp 11b, the winning-a-prize lamps 22b-26b, the side lamp 27, and the game effect lamps 30a-30c.

Lighting/putting-out-lights signal is outputted to the emitter which corresponds [a / sphere detection effective lamp 11]. In addition, lighting/putting-out-lights pattern is memorized by Built-in ROM or external ROM of CPU351 for ramp control.

[0065] 74HC540 and 74HC14 which are general-purpose CMOS-IC are used as input-buffer circuits 355A and 355B. The input-buffer circuits 355A and 355B can pass a signal only in the direction which goes to the ramp-control substrate 350 from the main substrate 310. Therefore, there is no room to transmit a signal from the ramp-control substrate 350 side to the main substrate 310 side. Even if unjust reconstruction is added to the circuit in the ramp-control substrate 350, the signal outputted by unjust reconstruction will not get across to the main substrate 310 side. In addition, you may prepare a noise filter in the input side of the input-buffer circuits 355A and 355B.

[0066] Moreover, in the main substrate 310, buffer circuit 322,323A is prepared in the outside of output ports 315A and 315D. As buffer circuit 322,323A, 74HC250 and 74HC14 which are general-purpose CMOS-IC are used. Since the signal inputted into the interior of the main substrate 310 is prevented from the exterior according to such composition, the signal line by which a signal may be given to the main substrate 310 from the ramp-control substrate 350 can be lost still more certainly. In addition, you may prepare a noise filter in the output side of buffer circuit 322,323A.

[0067] Drawing 11 is the block diagram showing the example of composition of the signal transmitting portion of the sound control command in the main substrate 310, and the sound control board 700. With the gestalt of this operation, the sound control command for directing the voice output of the loudspeaker 29 prepared in the outside of the game field 7 according to game advance is outputted to the sound control board 700 from the main substrate 310.

[0068] As shown in drawing 11, sound control command is outputted from the output ports (output ports 0 and 4) 315A and 315E of the I/O Port section 315 in the basic circuit 311. From output port (output port 4) 314E, 8-bit data are outputted and a 1-bit INT signal is outputted from output port 315A. In the sound control board 700, each signal from the main substrate 310 is inputted into CPU701 for sound control through the input-buffer circuits 705A and 705B. In addition, when CPU701 for sound control does not build in the I/O Port, an I/O Port is prepared between the input-buffer circuits 705A and 705B and CPU701 for sound control.

[0069] And the speech synthesis circuit 702 by the digital signal processor generates the voice and the sound effect according to directions of CPU701 for sound control, and outputs them to the volume electronic switch 703, for example. The output level of CPU701 for sound control is made into the level according to

the volume set up, and the volume electronic switch 703 outputs it to the volume amplifying circuit 704. The volume amplifying circuit 704 outputs the amplified sound signal to a loudspeaker 29.

[0070] 74HC540 and 74HC14 which are general-purpose CMOS-IC are used as input-buffer circuits 705A and 705B. The input-buffer circuits 705A and 705B can pass a signal only in the direction which goes to the sound control board 700 from the main substrate 310. Therefore, there is no room to transmit a signal from the sound control board 700 side to the main substrate 310 side. Therefore, even if unjust reconstruction is added to the circuit in the sound control board 700, the signal outputted by unjust reconstruction does not get across to the main substrate 31 side. In addition, you may prepare a noise filter in the input side of the input-buffer circuits 705A and 705B.

[0071] Moreover, in the main substrate 310, buffer circuit 322,322A is prepared in the outside of output ports 315A and 315E. As buffer circuit 322,322A, 74HC250 and 74HC14 which are general-purpose CMOS-IC are used. Since the signal inputted into the interior of the main substrate 310 is prevented from the exterior according to such composition, the signal line by which a signal may be given to the main substrate 310 from the sound control board 700 can be lost still more certainly. In addition, you may prepare a noise filter in the output side of buffer circuits 620 and 67A.

[0072] Drawing 12 is the block diagram showing the example of 1 composition of the power supply substrate 920. The power supply substrate 920 is installed independently with the main substrate 310, the display-control substrate 800, the sound control board 700, the ramp-control substrate 350, and the electrical-part control board of expenditure control board 370 grade, and generates the voltage which each electrical-part control board and mechanism element of the game inside of a plane use. In this example, AC24V, VSL (DC+30V), DC+21V, DC+12V, and DC+5V are generated. Moreover, the capacitor 926 used as a backup power supply is charged from the line of a power supply which drives DC+5V, i.e., IC on each substrate etc. In addition, VSL is generated in a rectifier circuit 922 by carrying out the rectification pressure up of AC24V with a rectifying device. VSL serves as a solenoid drive power supply.

[0073] A transformer 921 changes the alternating voltage from AC power supply into 24V. AC24V voltage is outputted to a connector 925. Moreover, a rectifier circuit 922 generates the direct current voltage of AC24V to +30V, and outputs it to DC-DC converter 923 and a connector 925. DC-DC converter 913 has one or more converters IC 932 (drawing 12 shows only one.), generates +21V, +12V, and +5V based on VSL, and outputs them to a connector 915. The comparatively mass capacitor 933 is connected to the input side of a converter IC 932. Therefore, when the electric power supply to the game machine from the outside stops, the direct current voltage of +30V, +12V, and +5V grade falls comparatively gently. Consequently, a capacitor 933 plays the role of the auxiliary drive power supply

mentioned later. A connector 925 is connected for example, to a relay substrate, and the power of voltage required for each electrical-part control board and a mechanism element is supplied from a relay substrate.

[0074] However, each connector which results in each electrical-part control board is prepared in the power supply substrate 920, and you may make it supply each voltage which results in each substrate, without minding a relay substrate from the power supply substrate 920. Moreover, although one connector 925 is represented and shown in drawing 12, the connector is prepared in each electrical-part control board correspondence.

[0075] The +5V line from DC-DC converter 913, it branches and backup +5V line is formed. The mass capacitor 926 is connected between backup +5V line and ground level. A capacitor 926 serves as a backup power supply which supplies power so that a storage state can be held to the backup RAM of an electrical-part control board when the electric power supply to a game machine is intercepted (backup storage means which may be in the content maintenance state of storage also at the time of RAM, i.e., an electric power supply halt, by which power supply backup is carried out). Moreover, the diode 927 for antisuckbacks is inserted between +5V line and backup +5V line. With the gestalt of this operation, +5V for backup are supplied to the main substrate 310.

[0076] In addition, you may use the cell which can be charged from +5V power supply as a backup power supply. If the state where an electric power supply is not carried out from +5V power supply carries out predetermined-time continuation in using a cell, a battery charger whose capacity is lost will be used.

[0077] Moreover, IC902 for power supply surveillance is carried in the power supply substrate 920. IC902 for power supply surveillance introduces VSL voltage, and detects generating of power off by supervising VSL voltage. A sag signal (power off signal) is outputted noting that power off will specifically arise, if VSL voltage becomes below a predetermined value (this example +22 V). In addition, as for the supply voltage for surveillance, it is desirable that it is voltage higher than the supply voltage (this example +5 V) of the circuit element carried in each electrical-part control board. In this example, VSL which is the voltage immediately after changing into a direct current from an alternating current is used. The sag signal from IC902 for power supply surveillance is supplied to main substrate 310 grade.

[0078] Although the predetermined value for IC902 for power supply surveillance detecting power off is usually lower than the voltage at the time, it is voltage which is the grade which can operate while CPU on each electrical-part control board is for a while. Moreover, IC902 for power supply surveillance is higher than the voltage (this example +5 V) for driving circuit elements, such as CPU, and since it is constituted so that the voltage immediately after changing into a direct current from an alternating current may be supervised, the surveillance range can be extended to the voltage which CPU needs. Therefore, more precise surveillance can be performed. Furthermore, since the voltage supplied to the various switches of a

game machine is +12V when using VSL (+30V) as surveillance voltage, prevention of the switch-on incorrect detection at the time of power supply hits is also expectable. Namely, if the voltage of +30V power supply is supervised, a fall of that is detectable in the stage before +12V made after +30V creation begin to fall.

[0079] Therefore, although a switch output will come to present an ON state if the voltage of +12V power supply falls, if +30V supply voltage which falls earlier than +12V is supervised and power off is recognized, before a switch output presents an ON state, the state where go into the state of the waiting for power supply restoration, and a switch output is not detected, and a bird clapper will be made.

[0080] Moreover, since IC902 for power supply surveillance is carried in the power supply substrate 920 separate from an electrical-part control board, it can supply a power off signal to two or more electrical-part control boards from a power supply supervisory circuit. However there may be an electrical-part control board which needs a power off signal, since one power supply surveillance means should just be established, even if it performs revertive control which each electrical-part control means in each electrical-part control board mention later, the cost of a game machine does not go up so much.

[0081] in addition, with the composition shown in drawing 12 , although the detection output (power off signal) of IC902 for power supply surveillance is transmitted to each electrical-part control board (here -- the main substrate 310) through a buffer circuit 918, the composition which transmits one detection output to a relay substrate, and distributes the same signal as each electrical-part control board from a relay substrate, for example may be used for it Moreover, you may prepare the buffer circuit according to the number of substrates which needs a power off signal.

[0082] Drawing 13 is the block diagram showing the example of 1 composition of the circumference of CPU314 in the main substrate 310. As shown in drawing 13 , the power off signal (sag signal) from the power supply supervisory circuit (power supply surveillance means) of the power supply substrate 920 is connected to the mask impossible interruption terminal (XNMI terminal) of CPU314. A power supply supervisory circuit is a circuit which supervises the voltage of the power supply of either of the various DC power supplies which a game machine uses, and detects a supply voltage fall. With the gestalt of this operation, if the supply voltage of VSL is supervised and a voltage value turns into below a predetermined value, the power off signal of a low level will be generated. VSL is the greatest thing in the direct current voltage used with a game machine, and is +30V in this example. Therefore, CPU314 can check generating of power off by interrupt processing.

[0083] The system-reset circuit 320 is also shown in drawing 13 . Reset IC320a will make an output high-level, if only the predetermined time it is decided by the capacity of an external capacitor that will be a power up makes an output a low level and a predetermined time passes. Namely, a reset signal is started high-level and CPU314 is changed into the state which can be operated. Moreover, reset IC320a will make an output a low level, if the supply voltage of VSL which is supply voltage

equal to the supply voltage which a power supply supervisory circuit supervises is supervised and a voltage value turns into below a predetermined value (it is a low value from the supply voltage value to which a power supply supervisory circuit outputs a power off signal). Therefore, after processing according to the power off signal from a power supply supervisory circuit at the time of a predetermined electric power supply halt, the system reset of CPU314 is carried out.

[0084] As shown in drawing 13, the reset signal from reset IC320a is inputted into the clear terminal of a counter IC 941 through an inverter circuit (NOT circuit) 944 while it is inputted into NAND circuit 947. A counter IC 941 will count the clock signal from VCO 943, if the input to a clear terminal is set to a low level. And 941Qcounter IC5 outputs are inputted into NAND circuit 947 through NOT circuit 945,946. Moreover, 941Qcounter IC6 outputs are inputted into the clock terminal of a flip-flop (FF) 942. D input of a flip-flop 942 is fixed high-level, and Q output is inputted into OR circuit (OR circuit) 949. The output of NAND circuit 947 is introduced into the input of another side of OR circuit 949 through NOT circuit 948. And the output of OR circuit 949 is connected to the reset terminal of CPU314. According to such composition, since 2 times of reset signals (low-level signal) are given to the reset terminal of CPU314 at a power up, CPU314 starts operation certainly.

[0085] And detection voltage for setting to +22V detection voltage (voltage which will output a power off signal) of a power supply supervisory circuit, and, for example, making a reset signal into a low level is set to +9V. Since a power supply supervisory circuit and the system-reset circuit 320 supervise the voltage of the same power supply VSL when constituted such, it can be certainly set as the predetermined period of a request of the difference of the timing to which a voltage supervisory circuit outputs a power off signal, and the timing to which the system-reset circuit 320 outputs a system-reset signal. A desired predetermined period is a period after starting processing according to the power off signal from a power supply supervisory circuit at the time of an electric power supply halt until processing is certainly completed at the time of an electric power supply halt.

[0086] The content is saved, even if a part of RAM [at least] is backed up by the backup power supply supplied from a power supply substrate and the power supply to a game machine **, while power is not supplied from +5V power supply which is a drive power supply of CPU314 grade. And if +5V power supply is restored, since a reset signal will be emitted from the system-reset circuit 320, CPU314 returns to a normal operating state. Since required data are then saved at Backup RAM, it can return to the game state at the time of power failure generating at the time of the restoration from a power failure etc.

[0087] In addition, although 2 times of reset signals (low-level signal) are given to the reset terminal of CPU314 with the composition shown in drawing 13 at a power up, even if there is only one standup timing of a reset signal, when using CPU by which reset release is carried out certainly, the circuit element shown with signs

941-949 is unnecessary. In this case, the output of reset IC320a is connected to the reset terminal of CPU314 as it is.

[0088] CPU314 used with the gestalt of this operation also builds in the I/O Port (PIO), and the timer/counter circuit (CTC). PIO has 4 bits of PB0-PB3, and 1 byte of port of PA0-PA7. the port of PB0-PB3, and PA0-PA7 -- an input/output -- it can be set as all In addition, as shown in drawing 13, the output signal of each switch, such as the sphere pilot switch 13, is inputted through buffer circuit 578A which reverses logic, and input port 578.

[0089] Next, operation of a game machine is explained. Drawing 14 is a flow chart which shows the main processing which CPU314 in the main substrate 310 performs. If a power supply is switched on to a game machine and CPU314 starts, in main processing, CPU314 will perform required initial setting first.

[0090] In initial-setting processing, CPU314 is first set as interrupt inhibition (Step S1). Next, interrupt mode is set as interrupt mode 2 (Step S2), and the stack-pointer specification address is set as a stack pointer (Step S3). And a built-in device register is initialized (step S4). Moreover, after initializing CTC (the counter/timer) and PIO (parallel input/output port) which are a built-in device (built-in circumference circuit) (Step S5), RAM is set as an accessible state (Step S6).

[0091] CPU314 used with the gestalt of this operation also builds in the I/O Port (PIO), and the timer/counter circuit (CTC). Moreover, CTC is equipped with two an external clock / timer trigger input CLK/TRG 2 and 3, and two timer output ZC/TO 0 and 1.

[0092] Three kinds of following modes are prepared for CPU314 used with the gestalt of this operation as the mode of interruption (INT) in which a mask is possible. In addition, if interruption in which a mask is possible occurs, CPU314 saves the content of a program counter to a stack while setting it as an interrupt inhibition state automatically.

[0093] Interrupt mode 0: The built-in device which performed the interruption request sends out a RST instruction (1 byte) or a CALL instruction (3 bytes) on the internal data bus of CPU. Therefore, CPU314 executes the instruction of the address specified by the address or the CALL instruction corresponding to the RST instruction. At the time of reset, CPU314 becomes interrupt mode 0 automatically. Therefore, in initial-setting processing, it is necessary to perform processing for setting it as interrupt mode 1 or interrupt mode 2 to set it as interrupt mode 1 or interrupt mode 2.

[0094] Interrupt mode 1: When interruption is received, it is the mode which always flies to 0038 (h) addresses.

[0095] Interrupt-mode 2: The address compounded from the interruption vector (1-byte [:] least significant bit 0) which the value (1 byte) and built-in device of a specific register (I register) of CPU314 output is the mode which shows an interruption address. That is, an interruption address is the address shown by 2

bytes by which the high order address was made the value of a specific register, and the low rank address was made the interruption vector. Therefore, interrupt processing can be installed in the eventh arbitrary (it is discontinuous) street. Each built-in device has the function which sends out an interruption vector, when performing an interruption request.

[0096] Therefore, if set as interrupt mode 2, it will become possible to become possible to process easily the interruption request from each built-in device, and to install interrupt processing in the arbitrary positions in a program. Furthermore, interrupt mode 1 is easy also for differing and preparing each interrupt processing for every interruption generating factor. As mentioned above, with the gestalt of this operation, CPU314 is set as interrupt mode 2 in Step S2 of initial-setting processing.

[0097] And it is checked whether data protection processing (for example, power failure generating NMI processing of addition of parity data etc.) of a backup RAM field has been performed at the time of power off (Step S7). With the gestalt of this operation, when unexpected power off arises, processing for protecting the data of a backup RAM field is performed. Let the case where such protection processing is performed be those with backup. If those without backup are checked, CPU314 will perform initialization processing.

[0098] With the gestalt of this operation, it is checked according to the state of the backup flag set as a backup RAM field at the time of power off whether backup data are in a backup RAM field. In this example, if "55H" is set as the backup flag field as shown in drawing 15, those with backup (ON state) are meant, and if values other than "55H" are set up, those without backup (OFF state) are meant in it.

[0099] If those with backup are checked, CPU314 will perform data check (this example parity check) of a backup RAM field. When it restores after unexpected power off arose, since the data of a backup RAM field must have been saved, a check result becomes normal. Since an internal state cannot be returned to the state at the time of power off when a check result is not normal, initialization processing performed by the power up which it is not at the power failure restoration time is performed.

[0100] If the check result is normal (Step S8), CPU314 will perform game state restoration processing for returning the internal state of game control means, and the control state of electrical-part control means, such as a display-control means, to the state at the time of power off (step S9). And the evacuation value of PC (program counter) saved to the backup RAM field is set as PC, and returns to the address.

[0101] In initialization processing, CPU314 performs RAM clear processing first (Step S11). Moreover, initializing processing which sets initial value as predetermined working areas (for example, the random number counter for a pattern judging, the buffer for a pattern judging, an expenditure command storing pointer, etc.) is also performed. Furthermore, processing for initializing a sub substrate (the ramp-control substrate 350, the expenditure control board 370, the sound control board 700,

display-control substrate 800) is performed (Step S13). The processing which initializes a sub substrate is processing which sends out the command for initial setting.

[0102] And a setup of the register of CTC prepared in CPU314 so that a timer interruption may start periodically every 2ms is performed (Step S14). That is, the value which is equivalent to 2ms as initial value is set as a predetermined register (time constant register). And since it considers as interrupt inhibition in Step S1 of initial-setting processing, interruption is permitted before finishing initialization processing (Step S15).

[0103] If execution (Steps S11-S15) of initialization processing is completed, it will shift to the loop processing by which the random number update process for a display (Step S16) is performed in main processing.

[0104] With the gestalt of this operation, it is set up so that the built-in CTC of CPU314 may generate a timer interruption repeatedly. With the gestalt of this operation, a repeat period is set as 2ms. ** [generating of a timer interruption / perform / game control processing of Steps S21-S31 / CPU314 / as shown in drawing 16 / and]

[0105] In game control processing, first, CPU314 inputs the state of the sphere pilot switch 13, the starting sphere pilot switch 19, the count switch 21, common adjustable winning-a-prize operation switch 22a, the winning-a-prize mouth switches 23a-26a, the pattern operation switch 28, V winning-a-prize switch 41, and the eccrisis switch 44 through a switching circuit 316, and carries out those state judgments (switch processing : step S21).

[0106] Subsequently, various unusual diagnostic processes are performed by the self-checking function with which the interior of the pachinko game machine 1 is equipped, and according to the result, if required, an alarm will be emitted (error processing : step S22).

[0107] Next, processing which updates each counter which shows each random number for a judgment, such as a random number for a pattern judging used for game control, is performed (Step S23). CPU314 performs processing which updates further random numbers for a display, such as a random number which determines the kind of halt pattern, (Step S24).

[0108] Drawing 17 is explanatory drawing showing each random number. Each random number is used as follows.

- (1) Random 1 : determine whether generate a hit or not (= for a hit judging for pattern determination).
- (2) Random 2-1 to 2-2 : determine the combination of the pattern at the time of the
- (3) random 3:hit for blank pattern determination of right and left (= for hit pattern determination for a pattern judging).
- (4) Determine the change patterns at the time of a random 4:hit etc. (for change pattern determination).

[0109] in addition, the game effect is heightened -- random numbers other than the

random number of above-mentioned (1) - (4) are also used for accumulating At Step S23, CPU314 counts up the counter for generating the random number for a hit judging of (1), and the random number for a hit pattern judging of (3) (1 addition). That is, they are the random numbers for a judgment and random numbers other than these are random numbers for a display.

[0110] Furthermore, CPU314 performs pattern process processing (Step S25). In pattern process control, processing which corresponds according to the pattern process flag for controlling a pachinko game machine in predetermined sequence according to a game state is selected and performed. And the value of a pattern process flag is updated during each processing according to a game state.

[0111] Subsequently, CPU314 performs processing which sets the display-control command about a pattern as the predetermined field of RAM313, and sends out a display-control command (display-control command control processing : step S27).

[0112] Furthermore, CPU314 performs information output processing which outputs data supplied to for example, a hole administrative computer, such as right generating information and great success information, (Step S29).

[0113] Moreover, CPU314 performs drive instructions in the solenoid circuit 317, when predetermined conditions are satisfied (Step S30). the solenoid circuit 317 -- drive instructions -- responding -- solenoids 60 and 61 -- driving -- making the pieces 33a and 33b of opening and closing into an open state or a closed state **** -- cover -- a member 37 is made into a cover state or the state where it does not cover In addition, CPU314 performs drive instructions in the motor circuit 318, when predetermined conditions are satisfied. The motor circuit 318 drives motors 62 and 63 according to drive instructions, and carries out predetermined operation to body of revolution 16 or the flare-part material 39.

[0114] And CPU314 performs awarded-balls processing which performs a setup of the number of awarded balls based on detection outputs, such as the switches 23a-26a for detecting winning a prize to each winning-a-prize mouth, etc. (Step S31). Specifically according to winning-a-prize detection, expenditure control command is outputted to the expenditure control board 370. CPU for expenditure control carried in the expenditure control board 370 drives sphere expenditure equipment according to expenditure control command.

[0115] By the above control, game control processing will be started every 2ms with the gestalt of this operation. In addition, although game control processing is performed by timer-interruption processing, only the set of a flag in which it is shown that interruption occurred is made, and game control processing may be made to perform in timer-interruption processing with the gestalt of this operation in main processing.

[0116] Moreover, a setup of a timer interruption is made in main processing, and since game control processing is performed by the timer-interruption processing based on the timer interruption which the internal timer of CPU314 generates periodically during execution of loop processing, all the game control processings are

performed certainly. That is, since it does not return to loop processing until all the game control processings are performed, it is guaranteed that all the processings of each under game control processing carry out the completion of execution.

[0117] As explained above, with the gestalt of this operation, interrupt mode 2 is set up by initial-setting processing to CPU314 which builds in CTC and PIO. Therefore, the periodical timer-interruption processing using Built-in CTC is easily realizable. Moreover, timer-interruption processing can be installed in the arbitrary positions on a program. Moreover, the switch detection processing using Built-in PIO etc. is easily realizable by interrupt processing. Consequently, program composition is simplified and the effect of a program development man day decreasing can be acquired.

[0118] CPU314 checks [of Step S25] whether specially, in pattern process processing, as shown in drawing 18 , the pattern operation switch 38 has turned on (Step S51). When the pattern operation switch 38 turns on, the value of each random number, such as a random number for a hit judging, is extracted (Step S52).

[0119] Subsequently, based on the value of the random number for a hit judging which extracted CPU314 at Step S52, hit/determines a gap (Step S53). Here, the random number for a hit judging is made to take the value of the range of 0-299. As shown in drawing 19 , when the value is "3", for example, at the time of low probability, it determines "" is a gap, when it is decided that it will be hit" and it is the other value." At the time of high probability, when the value is "3", "7", "79", "103" or, and "107", for example, it determines "" is a gap, when it is decided that it will be hit" and it is the other value."

[0120] When judged with a hit, the random number for hit pattern determination (random 3) is extracted, it hits according to the value, and a pattern is determined (Step S54). With the form of this operation, each pattern of the pattern number which hits and is set as the pattern table according to the value of the extracted random 3 is determined as a hit pattern. The pattern number of the right and left corresponding to each of the combination of two or more kinds of hit patterns is set to the hit pattern table. Moreover, the change pattern of a pattern is determined based on the value of the random number for change pattern determination (random 4) currently extracted at Step S52 (Step S55).

[0121] When judged with a blank, CPU314 determines the halt pattern when not considering as a hit. With the form of this operation, a left figure handle is determined according to the value extracted at Step S52, i.e., the value of random 2-1 currently extracted, (Step S56). And a right figure handle is determined according to the value of random 2-2 (Step S59). When the determined right figure handle is in agreement with a left figure handle, the pattern corresponding to the value added to the value of the random number corresponding to the right figure handle one time is made not in agreement with the hit pattern 57 here as a halt pattern of a right figure handle.

[0122] Furthermore, CPU314 determines the change pattern of a pattern about the

case where a hit preliminary announcement is performed, based on the value extracted at Step S52, i.e., the value of the random number for change pattern determination (random 4) currently extracted, (Step S58).

[0123] It is determined whether the display mode of the pattern change based on starting passage as mentioned above considers as a hit or it considers as a blank, and the combination of each halt pattern is determined. In addition, with the gestalt of this operation, since an adjustable display with the adjustable drop 9 is performed even if it is the case where the game state is controlled by the right generating state (the same when it is in a great success state), the judgment against which hit/rubs is made. Therefore, processing shown in drawing 18 is performed even if it is the case where the game state is controlled by the right generating state.

[0124] Drawing 20 is a flow chart which shows an example of the program of the pattern process processing which CPU314 performs. The pattern process processing shown in drawing 20 is concrete processing of Step S25 in the flow chart of drawing 16. In case CPU314 performs pattern process processing, it processes either of Steps S300-S308 shown in drawing 20 according to an internal state.

[0125] Waiting processing for pattern change (Step S300): Wait for a hit ball to pass a predetermined passage mouth and for the pattern operation switch 38 to turn on. ON of the pattern operation switch 38 extracts the random number for hit determination. That is, the first half of the processing shown in drawing 18 is performed.

Pattern judging processing (Step S301): Extraction of the random number for hit determination determines whether having been extracted considers as a gap whether it hits and is considered as a hit according to the value of the random number for determination. That is, half the inside of the processing shown in drawing 18 is performed.

Halt pattern setting processing (Step S302): Determine the halt pattern of a right-and-left pattern. That is, the second half of the processing shown in drawing 18 is performed.

[0126] Complete-diagram handle change start processing (Step S303): Control so that the change start of the complete diagram handle is carried out in the adjustable drop 9. At this time, the information which orders it the right-and-left last halt pattern and a change mode is transmitted to the display-control substrate 800. Moreover, when a background and a character are also displayed on the adjustable drop 9, it controls so that the display-control command data according to it are sent out to the display-control substrate 800.

[0127] Waiting processing for a complete-diagram handle halt (Step S304): If a predetermined time passes, it will control so that the complete diagram handle displayed in the adjustable drop 9 is stopped. Moreover, it controls so that a left figure handle is stopped to predetermined timing to the timing of a complete diagram handle halt. Furthermore, it controls so that the display-control command data according to the background and character which are displayed in the adjustable

drop 9 are suitably sent out to the display-control substrate 800.

[0128] Hit display processing (Step S305): A halt pattern hits and it becomes the combination of a pattern, if it is not in a right generating state when what V winning-a-prize switch 41 turned on after that is checked, an internal state (process flag) will be updated so that it may shift to Step S306, and if it is in a right generating state, an internal state will be updated so that it may shift to Step S308. A halt pattern hits, and in not being the combination of a pattern, it updates so that an internal state may be shifted to Step S300, if it is not in a right generating state, and if it is in a right generating state, it will update an internal state so that it may shift to Step S306. In addition, the combination of a hit pattern is the combination to which the right-and-left pattern was equal.

[0129] Processing among a right generating state (Step S306): Perform control which makes an effective state body of revolution 16 and the starting sphere pilot switch 19. Specifically, while initializing a counter and a flag, a motor 62 is driven, control of rotation/halt is performed for body of revolution 16 (when it is not in a right generating state, you may be made to perform rotation/halt control), or the detection result of the starting sphere pilot switch 19 is processed effectively. Moreover, processing which checks formation of the Kaisei conditions of a large winning-a-prize mouth and formation of the end conditions of a right generating state is performed. If the Kaisei conditions of a large winning-a-prize mouth are satisfied, an internal state will be updated so that it may shift to Step S307. If the end conditions of a right generating state are satisfied, an internal state will be updated so that it may shift to Step S308. In addition, at this example, if processing of a check of whether the pattern operation switch 38 turned on like S300 in state processing etc. is also performed and ON of the pattern operation switch 38 is checked during right generating since it is the composition that the display of the judgment pattern in the adjustable drop 9 is performed even if it is among a right generating state, an internal state will be updated so that it may shift to Step S301.

[0130] under large winning-a-prize mouth opening -- processing (Step S307): -- processing which checks the control which sends out the display-control command data of a large winning-a-prize mouth round display to the display-control substrate 800, and formation of the closing conditions of a large winning-a-prize mouth is performed. If the closing conditions of a large winning-a-prize mouth are satisfied and the end conditions of a right generating state will not be satisfied, an internal state is updated so that it may shift to Step S306. If the right generating state will be completed when the closing conditions of a large winning-a-prize mouth are satisfied if a right generating state is completed during opening of a large winning-a-prize mouth or, an internal state will be updated so that it may shift to Step S300. In addition, in this example, since it is the composition that the display of the judgment pattern in the adjustable drop 9 is performed even if it is among a right generating state, also in processing, processing of a check of whether the pattern operation switch 38 turned on etc. is performed like S300 during large winning-a-prize mouth

opening.

[0131] Right generating state end processing (Step S308): Perform the display for reporting to a game person that the right generating state was completed. If the display is completed, an internal flag etc. will be returned to an initial state, and an internal state will be updated so that it may shift to Step S300.

[0132] If a game sphere wins a prize of a predetermined passage mouth and the pattern operation switch 38 turns on as mentioned above, although CPU314 considers as a gap whether it considers as a hit or determines a halt pattern and an adjustable display pattern, it will give the display-control command according to the determination to CPU801 for display controls of the display-control substrate 800 in pattern process processing of Step S25 (refer to drawing 16). CPU801 for display controls performs the display control of the adjustable drop 9 according to the display-control command from the main substrate 310.

[0133] Next, change of a judgment pattern is explained using an example. Drawing 21 is explanatory drawing showing the example of the right-and-left pattern used with the form of this operation. As shown in drawing 21 , each pattern displayed as a right-and-left pattern with the form of this operation is the ten same patterns in right and left. A display of the pattern of the pattern number 10 displays [next] the pattern of the pattern number 1. And if right-and-left patterns stop together by "1", "3", "5", "7", or "9", they will be in a high probability state. That is, they serve as a probability-changing figure.

[0134] Drawing 22 is explanatory drawing showing the example of the background pattern displayed on the adjustable drop 9 used with the gestalt of this operation. In this example, the background of the (A) exercise hall, the (B) flash, the (C) aura, and (D) smoke is used. Moreover, the display shown in drawing 21 (E) shows the example of the demonstration screen displayed on the non-game middle class of a game machine.

[0135] Drawing 23 is explanatory drawing showing the example of the character displayed on the adjustable drop 9 used with the form of this operation. In this example, the (A) (character A and B) character B is used. the state where temporary-stopped or the left figure handle stopped in this example -- becoming -- **** -- a right figure handle -- change -- when working, characters A and B are displayed that the blowdown performs a great success preliminary announcement Although there are two or more great success preliminary announcement modes (great success preliminary announcements 1 and 2) and the mode of the great success preliminary announcement 1 is independently used with the form of this operation, the mode of the great success preliminary announcement 2 is displayed that a predetermined time passes after the display of the great success preliminary announcement 1 is made.

[0136] In addition, with the gestalt of this operation, as a great success preliminary announcement, although two modes are used, you may use much more kinds. Moreover, although a preliminary announcement is made by the blowdown of a

character with the gestalt of this operation, the mode of a preliminary announcement is good by any modes, if it can be recognized that the game person is announced beforehand. For example, it is good also by the change mode of a different pattern from usual [of a different character from usual / operation or usual]. Furthermore, it is good also as a preliminary announcement per probability changing in the preliminary announcement used when possibility that a hit will arise in a probability-changing figure is high. Moreover, the high preliminary announcement of the probability that a hit will occur, and the probability that a hit will occur may divide into a low preliminary announcement.

[0137] CPU801 for display controls in the display-control substrate 800 will perform control which indicates on a screen the background beforehand decided in each change pattern, and the character by move, if a display-control command is received from the main substrate 310. In addition, the change of a background or a character is performed to the timing decided beforehand, and CPU801 for display controls also controls them uniquely.

[0138] Next, sending out of a display-control command to the display-control substrate 800 is explained from the main substrate 310. Drawing 24 is explanatory drawing showing the signal line of the display-control command transmitted to the display-control substrate 800 from the main substrate 310. As shown in drawing 24 , with the form of this operation, a display-control command is transmitted to the display-control substrate 800 from the main substrate 310 by eight signal lines of the display-control signals D0-D7. Moreover, between the main substrate 310 and the display-control substrate 800, the signal line of the display-control INT signal for transmitting a strobe signal is also wired.

[0139] A display-control command is 2-byte composition, as shown in drawing 25 , the 1st byte of MODE (classification of a command) is expressed with the form of this operation, and the 2nd byte of EXT (kind of command) is expressed with it. The head bit (bit 7) of MODE data is surely set to "1", and the head bit (bit 7) of EXT data is surely set to "0." In addition, the command form shown in drawing 25 is an example, and may use other command forms. Moreover, although control command will be constituted from this example by two control signals, the number of control signals which constitutes control command may be 1, and may be plural [three or more].

[0140] Drawing 26 is the timing chart showing the relation of the 8-bit control signal and INT signal (strobe signal) which constitute the control command to the display-control substrate 800. If a predetermined period passes after the data of MODE or EXT are outputted to an output port as shown in drawing 26 , CPU314 will make an ON state the INT signal which is a signal which shows data output. Moreover, an INT signal will be made into an OFF state if a predetermined period passes from there.

[0141] In addition, although the display-control command was explained, each control command sent out to other sub substrates is also the same as that of the form shown in drawing 24 and drawing 25 here.

[0142] Drawing 27 is explanatory drawing showing an example of the contents of the display-control command sent out to the display-control substrate 800. In the example shown in drawing 27, command 80XX(H) and (the any value of X= 4 bits) are display-control commands which specify the change pattern in the adjustable drop 9 which indicates the pattern by adjustable. In addition, the display-control command for specifying a change pattern serves also as change start directions.

[0143] Command 8F00(H) is a pattern power-up specification command sent out to a power up. A display-control means will start the control which performs an initial display, if a pattern power-up specification command is received.

[0144] Command 92XX(H) and 94XX(H) are display-control commands which specify the halt pattern of right and left of a pattern. Moreover, command A0XX(H) is a display-control command (definite command) which directs a halt of an adjustable display of a pattern.

[0145] Command BXXX is a display-control command sent out into a right generating state. Command B8XX is a display-control command which specifies the contents of a display in a right generating state in order to display on the adjustable drop 9 the displays (for example, display for reporting various information to a game person into the display which shows that it is among a right generating state, and a right generating state etc.) in connection with a right generating state. In addition, even if other commands, such as command 80XX and command 9XXX, are among a right generating state, they are sent out. Moreover, Command CXXX is a display-control command about change of a pattern, and the display state of the adjustable drop 9 without regards to the game in a right generating state.

[0146] The display-control means of the display-control substrate 800 will change the display state of the adjustable drop 9 according to the contents shown in drawing 27, if the display-control command mentioned above from the game control means of the main substrate 310 is received.

[0147] Drawing 28 is explanatory drawing showing an example of the content of the ramp-control command sent out to the ramp-control substrate 350 from the main substrate 310 which controls a game. A ramp-control command is also the 2-byte composition of MODE and EXT. In the example shown in drawing 28, command 80XX is a ramp-control command which specifies lighting/putting-out-lights pattern of emitters, such as a lamp. Reception of this ramp-control command extracts and performs the lamp and Light Emitting Diode display-control pattern corresponding to the specified change pattern in the ramp-control substrate 350. Moreover, although illustration is not carried out, command A0XX is a ramp-control command which directs the lamp and Light Emitting Diode display-control pattern at the time of a halt of an adjustable display of a pattern. Moreover, command B8XX is a ramp-control command which directs the display pattern of the lamp and Light Emitting Diode in a right generating state, in order to perform the lamp and Light Emitting Diode display control in connection with a right generating state (for example, control for performing lighting/putting out lights in the predetermined mode in a right

generating state). And a command 9001 (H) is a ramp-control command which directs the lamp and Light Emitting Diode display-control pattern at the time of a waiting-for-customers demonstration.

[0148] In addition, command 8XXX, 9XXX, AXXX, BXXX, and CXXX are ramp-control commands sent out from game control means according to a game advance situation. A command 9101 (H) is a ramp-control command sent out (when it is not among a right generating state and V winning-a-prize switch 41 is turned on), when a game state changes into a right generating state. When a right generating state ends a command 9102 (H) (when the number of times of continuation of the great success beforehand defined by the starting sphere pilot switch's 19 having detected the number-of-times winning-a-prize sphere of predetermined in the right generating state, and having specifically carried out number-of-times opening of predetermined of the large winning-a-prize mouth is digested.) Or when operation which generates a right further in a right generating state is performed (when V winning-a-prize switch 41 turns on in this example) It is the ramp-control command sent out. Command BXXX is sent out into a right generating state. In addition, with the gestalt of this operation, even if other commands, such as command 8XXX, are among a right generating state, they are sent out. A ramp-control means will change the display state of a lamp and Light Emitting Diode according to the content shown in drawing 28 , if the ramp-control command mentioned above from the game control means of the main substrate 310 is received. In addition, command 8XXX, 9XXX, AXXX, BXXX, and CXXX are used in common in the control state of a display-control command, sound control command, and community.

[0149] Drawing 29 is explanatory drawing showing an example of the contents of the sound control command sent out to the sound control board 700 from the main substrate 310 which controls a game. Sound control command is also the 2-byte composition of MODE and EXT. In the example shown in drawing 29 , command 80XX is sound control command which specifies the voice output pattern from a loudspeaker 29 etc. Reception of this sound control command extracts and performs the voice output pattern corresponding to the specified change pattern command in the sound control board 700. Command BXXX is sound control command which specifies the sound generating pattern outputted into a right generating state. In this example, although illustration is not carried out, in order to perform voice output control (for example, control performed in the predetermined mode in a right generating state) in connection with a right generating state, the sound control command (for example, command B8XX) which directs the voice output pattern in a right generating state is used. In addition, with the form of this operation, even if ramp-control commands, such as command 80XX, are also among a right generating state, they are sent out. Other commands are the sound control command without regards to change and the hit game of a pattern. A command 9101 (H) is sound control command sent out when a game state changes into a right generating state. A command 9102 (H) is sound control command sent out when a right generating

state is completed. The sound control means of the sound control board 700 will change a voice output state according to the contents shown in drawing 29 , if the sound control command mentioned above from the game control means of the main substrate 310 is received.

[0150] Hereafter, the example of the change pattern of a pattern is explained with reference to drawing 30 – drawing 33 . Drawing 30 is explanatory drawing showing an example of the pattern (upset condition) which constitutes each change pattern. Drawing 31 is the timing chart showing an example of change of the pattern at the time of a blank. Moreover, drawing 32 and drawing 33 are the timing charts showing an example of change of a pattern at the time of a hit preliminary announcement (when not considering as a case and a hit of a hit).

[0151] With the gestalt of this operation, at the time of a blank, as shown in drawing 31 (A), in the pattern display area of the “left” in the adjustable drop 9, change of a pattern is first performed according to Pattern a. Pattern a is a pattern which fluctuation velocity goes up little by little, as shown in drawing 30 . Then, change of fixed ** of Pattern b is performed, and after being controlled so that the pattern in front of 3 patterns of a halt pattern is displayed, change of Pattern c, therefore three patterns is performed. Pattern c is a pattern which becomes late and stops gradually, as shown in drawing 30 .

[0152] Moreover, in the pattern display area of the “right” in the adjustable drop 9, change of a pattern is performed according to Pattern a. Then, after 1 fixed-speed change, after being controlled so that the pattern in front of 3 patterns of a halt pattern is displayed, change of a pattern is performed according to Pattern c.

[0153] In addition, a left figure handle is repeated to the right direction and opposite direction of the change direction, and CPU801 for display controls of the display-control substrate 800 is fluctuated until a right figure handle is decided. That is, the display control of the left figure handle is carried out to the so-called shake upset condition. As for shake change, a pattern says the thing which shake up and down and which is displayed. Moreover, shake change is performed until the last halt pattern (definite pattern) is displayed. And if the display-control command which directs a complete diagram handle halt from the main substrate 310 is received, it will be in the definite state where terminate the shake upset condition of a left figure handle, and a right-and-left pattern does not move. In this example, for example, based on change pattern specification #1 command, after CPU801 for display controls performs pattern change processing for 9.0 seconds, it is made into a definite state. In addition, a right figure handle also performs shake operation after change by Pattern c, and you may make it be in a definite state after that. Moreover, it is good also as not the mode that sways a pattern for shake change up and down but a mode swayed right and left.

[0154] While changing the pattern, it displays a character A (refer to drawing 23) all over a screen, and CPU801 for display controls performs a display control so that a character A may be made to exercise suitably while it performs a display control so

that an "exercise hall" (refer to drawing 22) may be displayed as a background. Specifically, a background and a character are notified to VDP803. Then, VDP803 creates the image data of the directed background. Moreover, the image data of the directed character is created and it compounds with a background image. Furthermore, VDP803 compounds the image data of a right-and-left pattern in a synthetic picture. VDP803 also performs a display control to which the display control and the pattern which a character exercises are changed. That is, the configuration and display position of a character are changed according to the movement pattern decided beforehand. Moreover, the pattern display position is changed according to the fluctuation velocity notified from CPU801 for display controls.

[0155] In addition, in pattern display area on either side, CPU801 for display controls carries out the display control of the pattern in front of 3 patterns of a halt pattern to predetermined timing so that pattern change may stop in the specified halt pattern. Since a halt pattern on either side is notified at the time of a change start and the change pattern at the time of a blank is decided beforehand, CPU801 for display controls can also determine the pattern in front of 3 patterns which should be substituted while being able to recognize the change timing from Pattern a to Pattern b, and the change timing from Pattern b to Pattern c. It substitutes, a pattern is notified to VDP803, and VDP803 displays the notified pattern regardless of the determined pattern which is then displayed.

[0156] Drawing 31 (B) shows an example of the change pattern at the time of the blank in probability upset condition. By this change pattern, as shown in drawing, after change of a right-and-left pattern is performed according to Pattern a, Pattern b, and Pattern c, a right-and-left pattern stops simultaneously. In this example, after CPU801 for display controls performs pattern change processing between 5.5 seconds when change time was shortened for example, based on change pattern specification #35 command, it is made into a definite state. When using this change pattern, CPU801 for display controls is made to display a character A (to refer to drawing 23) all over a screen, and to perform a display control so that a character A may be made to exercise suitably while performing a display control so that an "exercise hall" (refer to drawing 22) may be displayed as a background.

[0157] With the gestalt of this operation, that is, CPU801 for display controls If the display-control command (refer to drawing 27) which specifies a change pattern from CPU314 of the game control means 310, i.e., the main substrate, is received While determining that a right-and-left pattern will indicate by adjustable using the change pattern shown in drawing 31 (A) and (B) according to the content of the specification, it determines to make a character A appear and to use the background screen of an "exercise hall."

[0158] Drawing 32 shows the example of the change pattern displayed when 17.0 seconds is notified as change time from the main substrate 310. It is determined uniquely whether if change time is notified, which change pattern of two or more

change patterns displayed in the change time will be used for CPU801 for display controls. One of two or more change patterns is illustrated by drawing 32 . In addition, CPU314 of the main substrate 310 hits and you may make it send the command which shows the hit and corresponding to kind of preliminary announcement change pattern which determined and determined the kind of preliminary announcement.

[0159] By the change pattern shown in drawing 32 , after a left figure handle stops, change of the right figure handle of Pattern d is performed. In addition, CPU801 for display controls carries out shake operation of the left figure handle in the idle state of the left figure handle under right figure handle change. Pattern d is a pattern with which fluctuation velocity falls gradually and change is performed by constant speed after that. And it goes into independent change operation (operation in the state where a left figure handle stops or stops [temporary]) of a right figure handle, and change of a right figure handle is performed according to Pattern b and Pattern c. If the display-control command which directs a complete diagram handle halt from the main substrate 310 is received, it will be in the definite state where terminate the shake upset condition of a left figure handle, and a right-and-left pattern does not move. In this example, for example, based on change pattern specification #9 command, after CPU801 for display controls performs pattern change processing between 17.0 seconds, it is made into a definite state.

[0160] Moreover, CPU801 for display controls substitutes a pattern before the independent change operation start of a right figure handle so that a pattern may be decided in the halt pattern notified from the main substrate 310 (a pattern flies and it controls). Since the change pattern is decided beforehand, CPU801 for display controls can also determine the pattern in front of 3 patterns which should be substituted while being able to recognize the change timing from Pattern d to Pattern b, and the change timing from Pattern b to Pattern c. In addition, a background and the kind of character do not change during change of a right figure handle.

[0161] As mentioned above, with the gestalt of this operation, CPU801 for display controls will determine using any of two or more change patterns which indicate by adjustable for 17.0 seconds the right-and-left pattern is indicated by adjustable, if change pattern specification #9 command is received from CPU314 of the main substrate 310.

[0162] And if a right-and-left pattern will stop and it will be in the independent change operating state of a right figure handle when using the change pattern of drawing 32 is determined, it will determine to continue and use a character A and the background screen of an "exercise hall."

[0163] In addition, the change pattern for change time 17.0 seconds shown in drawing 32 also carries out [CPU / for display controls /801] shake operation of the left figure handle up and down until a right figure handle is decided. Moreover, pattern substitution control of a right figure handle is performed to the timing which

a left figure handle stops. CPU801 for display controls determines a substitution pattern according to the number of change of the right halt pattern notified from the main substrate 310 at the time of a change start, and the pattern in the independent change period (for example, change period of the pattern d in drawing 32 , Pattern b, and Pattern c) of a right figure handle.

[0164] Furthermore, when performing a hit preliminary announcement is determined, CPU801 for display controls controls VDP803 so that the character A currently then displayed hits and it is displayed by the adjustable drop 9 in the mode of preliminary announcement 1 or the hit preliminary announcement 2 during independent change operation of a right figure handle. In addition, the mode of the hit preliminary announcement 2 is the developed type of the hit preliminary announcement 1. Moreover, CPU801 for display controls mentions the concrete way of determining later, although whether a hit preliminary announcement being performed and the mode of a preliminary announcement will be determined uniquely, if a display-control command is received.

[0165] Drawing 33 shows the example of the change pattern displayed when 22.0 seconds (during the reach middle) are notified as change time from the main substrate 31. CPU801 for display controls will determine uniquely whether to use which change pattern of two or more change patterns, if 22.0 seconds is notified as change time. In addition, one pattern in two or more change patterns is illustrated by drawing 33 .

[0166] By the change pattern shown in drawing 33 , after a left figure handle stops, change of the right figure handle of Pattern d is performed. And it goes into independent change operation of a right figure handle, and change of a right figure handle is performed according to Pattern b and Pattern f. Pattern f is high-speed change and a halt period sets it before the change start by Pattern f. If the display-control command which directs a complete diagram handle halt from the main substrate 310 is received, it will be in the definite state where terminate the shake upset condition of a left figure handle, and a right-and-left pattern does not move. In this example, after CPU801 for display controls performs pattern change processing between 22.0 seconds based on change pattern specification #8 command, without carrying out shortening of change time, it is made into a definite state.

[0167] Moreover, CPU801 for display controls substitutes a pattern before the independent change operation start of a right figure handle so that a pattern may be decided in the halt pattern notified from the main substrate 310. In addition, by the change pattern shown in drawing 33 , if a left figure handle stops, CPU801 for display controls will change a background image to a "flash" (refer to drawing 22).

[0168] As mentioned above, with the form of this operation, CPU801 for display controls will determine using any of two or more change patterns which indicate by adjustable for 22.0 seconds the right-and-left pattern is indicated by adjustable, if change pattern specification #8 command is received from CPU314 of the main substrate 310. And when using the change pattern of drawing 33 is determined, it

determines to change a background screen to a "flash" as a right-and-left pattern will stop and it will be in the independent change operating state of a right figure handle.

[0169] The change pattern for change time 22.0 seconds shown in drawing 33 also carries out [CPU / for display controls /801] shake operation of the left figure handle up and down until a right figure handle is decided. Moreover, pattern **** control of a right figure handle is performed to the timing which a left figure handle stops.

[0170] Furthermore, when performing a hit preliminary announcement is determined, CPU801 for display controls controls VDP803 so that the character currently then displayed hits and it is displayed by the adjustable drop 9 in the mode of preliminary announcement 1 or the hit preliminary announcement 2 during independent change operation of a right figure handle.

[0171] Next, the processing about transmission of a command etc. is explained. When it is going to output control command to each electrical-part control board (sub substrate) from game control means, a setup of a command transmitting table is performed in this example. Drawing 34 is explanatory drawing showing the example of 1 composition of a command transmitting table. One command transmitting table consists of 3 bytes, and INT data are set as the 1st byte. Moreover, the 1st byte of MODE data of control command are set to the 2nd byte of command data 1. And the 2nd byte of EXT data of control command are set to the 3rd byte of command data 2.

[0172] In addition, although the EXT data itself may be set as the field of the command data 2, to the command data 2, the data (buffer tbe data) for specifying the address of the table on which EXT data are stored may be made to be set. With the gestalt of this operation, if the bit 7 (work area reference bit) of the command data 2 is 0 as shown in drawing 35 (A), it is shown that the EXT data itself are set as the command data 2. In addition, such EXT data are data whose bit 7 is 0. Moreover, if a work area reference bit is 1 as shown in drawing 35 (B), it is other 7 bits (in drawing 35 (B)). since the case where 18 kinds of buffers are specified, respectively is assumed, a bit 4 – a bit 0 are used and the bit 6 and the bit 5 are made intact It is shown that it is the offset (compensation field for specifying the storing place of data) for specifying the address of the table on which EXT data are stored. In addition, for example, a pattern change pattern buffer, a pattern left figure handle buffer, a pattern right figure handle buffer, etc. are contained in the 18 above-mentioned kinds of buffers.

[0173] Drawing 36 is explanatory drawing showing the example of 1 composition of INT data. The bit 0 in INT data shows whether expenditure control command should be sent out to the expenditure control board 370. If a bit 0 is "1", what expenditure control command should be sent out for is shown. Therefore, CPU314 sets "01 (H)" as INT data for example, in awarded-balls processing (Step S31 of main processing). Moreover, the bit 1 in INT data shows whether a display-control command should be

sent out to the display-control substrate 800. If a bit 1 is "1", what a display-control command should be sent out for is shown. Therefore, CPU314 sets "02 (H)" as INT data for example, in display-control command control processing (Step S27 of main processing). The bits 2 and 3 of INT data are bits which show whether a ramp-control command and sound control command should be sent out, respectively, and if CPU314 becomes the timing which should send out those commands, they will set INT data, the command data 1, and the command data 2 as the command transmitting table which the pointer (for example, pattern command transmitting pointer) has pointed out. And when the command set as the command transmitting table is sent out, the applicable bit of INT data is set as "1", and MODE data and EXT data are set as the command data 1 and the command data 2.

[0174] With the gestalt of this operation, two or more command transmitting tables are prepared about each control command, respectively, and the command transmitting table which should be used is set up before command transmission. Moreover, you may set two or more command transmitting tables as one table. For example, as shown in drawing 37, one table containing two or more command transmitting tables which can store two or more display-control commands is prepared. Therefore, in display-control command control processing, from the command transmitting table which the pointer is putting, CPU314 sets up INT data, the command data 1, and the command data 2, and transmits a display-control command. And a pointer is updated. Then, transmitting processing of a display-control command is repeated until the command transmitting table specified by a pointer shows a termination code. In addition, you may make it constitute some tables (for example, table on which an expenditure number specification command is set up) prepared about each control command in ring buffer form.

[0175] Drawing 38 is a flow chart which shows the example of processing of the display-control command control processing (Step S27) in the game control processing shown in drawing 16. Display-control command control processing is processing including command output processing and INT signal output processing. In display-control command control processing, CPU314 evacuates the address (the contents of a read-out pointer) of a command transmitting table to a stack etc. first (Step S331). And the INT data of the command transmitting table which the read-out pointer had pointed out are loaded to an argument 1 (Step S332). An argument 1 becomes the input to the command transmitting processing mentioned later.

Moreover, the address which points out a command transmitting table is carried out +one (Step S333). Therefore, the address which points out a command transmitting table is in agreement with the address of the command data 1.

[0176] Then, CPU314 reads the command data 1 and sets them as an argument 2 (Step S334). An argument 2 also becomes the input to the command transmitting processing mentioned later. And a command transmitting manipulation routine is called (Step S335).

[0177] Drawing 39 is a flow chart which shows a command transmitting routine. In a

command transmitting routine, CPU314 sets it as the work area decided as a comparison value first (Step S351), the data, i.e., the INT data, set as the argument 1. Subsequently, the number of times of transmission = 4 is set as the work area decided as the number of processing (Step S352). And the address of the port 1 for outputting an expenditure control signal is set to IO address (Step S353). With the gestalt of this operation, the address of a port 1 is the address of the output port for outputting an expenditure control signal. Moreover, the address of ports 2-4 is the address of the output port for outputting a display-control signal, a ramp-control signal, and a sound control signal.

[0178] Next, CPU314 shifts a comparison value to the 1-bit right (Step S354). It is checked whether the carry bit has been set to 1 as a result of shift processing (Step S355). That the carry bit was set to 1 means that the bit by the side of the rightmost in INT data was "1." Although four shift processings are performed with the gestalt of this operation, when what expenditure control command should be sent out for is specified for example, a carry bit is set to 1 by the first shift processing.

[0179] When a carry bit is set to 1, in the data set as the argument 2, and this case, the command data 1 (namely, MODE data) are outputted to the address set up as the IO address (Step S356). Since the address of a port 1 is set as IO address when the first shift processing is performed, the MODE data of expenditure control command are then outputted to a port 1.

[0180] Subsequently, CPU314 subtracts the number of processing one time while adding IO address one time (Step S357) (Step S358). When the port 1 is shown before addition, the address of a port 2 is set to IO address by addition processing to IO address. A port 2 is a port for outputting a display-control command. And CPU314 returns to Step S354, if the value of the number of processing is checked (Step S359) and the value has not become 0. Shift processing is again performed at Step S354.

[0181] In the 2nd shift processing, the value of the bit 1 in INT data is extruded, and a carry flag is set to "1" or "0" according to the value of a bit 1. Therefore, the check of whether what a display-control command should be sent out for is specified is performed. The check of whether similarly what a ramp-control command and sound control command should be sent out for is specified by the 3rd time and 4th shift processing is performed. Thus, when each shift processing is performed, IO address corresponding to the command (expenditure control command, a display-control command, a ramp-control command, sound control command) checked by shift processing is set to IO address.

[0182] Therefore, when a carry flag is set to "1", control command is sent out to a corresponding output port (a port 1 – port 4). That is, sending-out processing of the control command to each electrical-part control means can be performed by one common module.

[0183] Moreover, in this way, since it is judged to which electrical-part control

means control command should be outputted only by shift processing, whether control command's being outputted to which electrical-part control means and the processing to judge are simplified.

[0184] Next, CPU314 reads the content of the argument 1 in which the INT data before a shift processing start are stored (Step S360), and outputs the read data to a port 0 (Step S361). With the gestalt of this operation, the address of a port 0 is a port for outputting the INT signal about each control signal, and is a port for the bits 0-4 of a port 0 outputting an expenditure control INT signal, a display-control INT signal, a ramp-control INT signal, and a sound control INT signal, respectively. By INT data, the bit corresponding to the output bit of the INT signal according to the control command (expenditure control command, a display-control command, a ramp-control command, sound control command) outputted by processing of Steps S351-S359 is "1." Therefore, the INT signal corresponding to the control command (expenditure control command, a display-control command, a ramp-control command, sound control command) outputted to either the port 1 - the port 4 is turned on.

[0185] Subsequently, CPU314 sets a predetermined value as a wait counter (Step S362), and it subtracts it every [1] until the value is set to 0 (Steps S363 and S364). This processing is processing for setting up the "on" period of the INT signal (control signal INT) shown in the timing chart of drawing 26 . If the value of a wait counter is set to 0, clear data (00) will be set up (Step S365), and the data will be outputted to a port 0 (Step S366). Therefore, an INT signal is turned off. And a predetermined value is set as a wait counter (Step S362), and it subtracts every [1] until the value is set to 0 (Steps S368 and S369). This processing is processing for setting up the period to the 1st EXT data output start from falling of an INT signal.

[0186] Therefore, the value set as a wait counter at Step S367 is a value which becomes sufficient period for all the electrical-part control means (CPU carried in the sub substrate) from which the period to the 1st EXT data output start from falling of an INT signal serves as a candidate for control command receiving to perform command reception certainly. Moreover, the value set as a wait counter is a value to which the period becomes longer than the time which processing of Steps S351-S359 takes.

[0187] The 1st byte of MODE data of control command are sent out as mentioned above. Then, CPU314 is Step S336 shown in drawing 38 , and adds the value which points out a command transmitting table one time. Therefore, the field of the 3rd byte of command data 2 is specified. CPU314 loads the content of the command data 2 to which it pointed to an argument 2 (Step S337). Moreover, it checks whether the value of the bit 7 (work area reference bit) of the command data 2 is "0" (Step S339). If it is not 0, the address will be computed by setting the start address of a command extension data-address table to a pointer (Step S339), and adding the value of the bit 6 of the command data 2 - a bit 0 to the pointer (Step

S340). And the data of the area which the address points out are loaded to an argument 2 (Step S341).

[0188] The EXT data in which it is sent out to electrical-part control means, and deals are set to the command extension data-address table one by one. Therefore, if the value of a work area reference bit is "1", the EXT data in the command extension data-address table according to the content of the command data 2 are loaded to an argument 2 by the above processing, and if the value of a work area reference bit is "0", the content of the command data 2 is loaded to an argument 2 as it is. In addition, even when EXT data are read from a command extension data-address table, the bit 7 of the data is "0."

[0189] Next, CPU314 calls a command transmitting routine (Step S342). Therefore, EXT data are sent out to the same timing as the case of sending out of MODE data. Then, CPU314 returns the address of a command transmitting table (Step S343), and updates the value of the read-out pointer which points out a command transmitting table (Step S344). When the value of a read-out pointer exceeds the position of the command transmitting table 12 shown in drawing 37, the value of a read-out pointer is returned to 0.

[0190] Furthermore, when non-transmitted control command is still set as the command transmitting table, it returns to Step S331. In addition, since control command will be continuously sent out when returning to Step S331, a delay time is set in order to vacate the interval between control command. Moreover, it is judged by comparing the value of for example, a command transmitting counter with the value of a read-out pointer whether non-transmitted control command is set up.

[0191] Each control command (expenditure control command, a display-control command, a ramp-control command, sound control command) of 2-byte composition is transmitted to corresponding electrical-part control means by the command control processing module which is one control signal output module as mentioned above. Although incorporation processing of control command will be started in electrical-part control means if falling of the INT signal as a taking-in signal is detected, before incorporation processing is completed, the new signal from game control means is not outputted to a signal line about which electrical-part control means. That is, positive command reception is performed in each electrical-part control means. In addition, each electrical-part control means may start incorporation processing of control command in the standup of an INT signal. Moreover, you may make polarity of an INT signal into the case where it is shown in drawing 26, and reverse.

[0192] Furthermore, with the form of this operation, when two or more control command is set as the command transmitting table, all control command is sent out by one command control processing. Since command control processing (for example, display-control command control processing) is started once at 2ms, in the main processing starting period of 2ms, all control command is sent out after all. Moreover, since two or more command transmitting tables are prepared for every

[to each control means] control command (a display-control command, a ramp-control command, sound control command, expenditure control command) with the form of this operation, respectively, it is also possible to, send out all display-control commands, a ramp-control command, and sound control command by one command control processing for example, when control command is set as the command transmitting table of a display-control command, a ramp-control command, and sound control command. That is, those control command can be sent out simultaneously (meaning in 1 main processing starting period). On advance of game production, since the sending-out timing of those control command is generated simultaneously, being constituted in this way is convenient. However, since it generates regardless of advance of game production, generally expenditure control command is not sent out simultaneously with a display-control command, a ramp-control command, and sound control command.

[0193] Here, the example of the transmit timing of the display-control command from the main substrate 310 is explained. In the complete diagram handle change start processing (Step S303) in the pattern process processing mentioned above, waiting processing for the completion of command transmitting is also performed with the gestalt of this operation. If change time and a halt pattern are determined in halt pattern setting processing of Step S302, although sending-out control of the display-control command for directing them in complete diagram handle change start processing will be performed, processing which stands by completion of transmission of a command in Step S303 is also performed. In the waiting processing for the completion of command transmitting, it checks whether sending out of a command has completed CPU314 by the notice from the display-control command control processing (Step S27) under game control processing (refer to drawing 16).

[0194] With the gestalt of this operation, CPU314 sends out the display-control command (change pattern specification command (80XX(H))) which can specify the change period shown in drawing 27 to the display-control substrate 800, when making change of a pattern start. Moreover, the display-control command (right-and-left pattern specification command) which shows the halt pattern of the already determined right and left continuously is sent out to the display-control substrate 800. Therefore, in the waiting processing for the completion of command transmitting, it is checked whether sending out of all the command of them has been completed. In addition, CPU314 may send out the display-control command which can specify change time, after sending out the display-control command which shows a halt pattern on either side.

[0195] Moreover, although not clearly shown in drawing 27 , CPU314 sends out the display-control command (change pattern command) with which the information which shows whether the information and hit preliminary announcement which can specify change time are performed is included to the display-control substrate 800 in this example. That is, each command which can specify change time with a preliminary announcement, and each command which can specify change time

without a preliminary announcement are defined. In addition, you may make it define separately the display-control command which can specify change time, and the display-control command which shows whether a hit preliminary announcement is performed.

[0196] In the waiting processing for the completion of command transmitting, if sending out of a display-control command is completed, CPU314 will start the change time timer for measuring the change time notified to the display-control substrate 800, and it will update a pattern process flag so that it may shift to Step S304. And in the waiting processing for a complete diagram handle halt (Step S304), if the thing whose deadline the change time timer passed is checked, CPU314 will set the display-control command which directs a complete diagram handle halt as a command transmitting table, and it will update a pattern process flag so that it may shift to Step S305.

[0197] As mentioned above, in pattern process processing, CPU314 sends out the information which directs a complete diagram handle halt to the display-control substrate 800, if the information that change time can be specified at the time of the start of change, and the information which directs a halt pattern are sent out to the display-control substrate 800 and a change time timer passes the deadline of (i.e., if the directed change time is completed). In the meantime, CPU314 does not have the delivery in the display-control substrate 800 in a display-control command. Therefore, the load which the display control of CPU314 of the main substrate 310 takes is reduced greatly.

[0198] Drawing 40 – drawing 42 are flow charts which show the example of processing of mask impossible interrupt processing (it processes at the time of an electric power supply halt) performed according to the power off signal from the power supply substrate 920.

[0199] In processing, CPU314 evacuates AF register (register of an accumulator and a flag) to a predetermined backup RAM field at the time of an electric power supply halt (Step S751). Moreover, an interruption flag is copied to a parity flag (Step S752). The parity flag is formed in the backup RAM field. Moreover, BC register, DE register, HL register, IX register, and a stack pointer are evacuated to a backup RAM field (Steps S754–S758). In addition, at the time of power supply restoration, the content of a register is restored based on the evacuated content, and the internal adjustment of an interruption authorized state / prohibition state is made at it according to the content of a parity flag.

[0200] subsequently -- the gestalt of this operation -- cover -- after changing a member 37 into a cover state (Step S759), the detecting signal of a predetermined period and the pattern operation switch 38 is checked And if a predetermined period passes, backup processing of a game state will be performed. In addition, in this example, since the pattern operation switch 38 does not turn on continuously, if the pattern operation switch 38 turns on, you may be made to perform backup processing of a game state. Moreover, when power off detection of the flare-part

material 39 is carried out working, you may be made to perform backup processing of a game state after the end of operation of the flare-part material 39. In this case, what is necessary is just to prepare the backup power supply for maintaining the drive of the motor 63 until operation of the flare-part material 39 is completed.

[0201] In addition, with the form of this operation, in order to measure a predetermined period, the counter for predetermined period measurement is used. The value of the counter for predetermined period measurement will presuppose that the predetermined period expired, if one is taken and the value is set to 0 from initial value m , whenever the loop (loop which begins from S761 and returns to S761) of switch detection processing in which it explains below is performed once. By the loop of detection processing, although there is an exception, since processing of simultaneously regularity is performed, m times as much time as the time which 1 round of a loop takes is mostly equivalent to a predetermined period.

[0202] In order to measure a predetermined period, you may use the built-in timer of CPU314. Namely, the predetermined value (equivalent to a predetermined period) is set as the built-in timer at the time of a switch detection processing start. And whenever the loop of switch detection processing is performed once, the counted value of a built-in timer is checked. And if counted value is set to 0, suppose that the predetermined period expired. Although interruption by the built-in timer can also be used in order to detect that the value of a built-in timer was set to 0, the program composition which reads and checks the counted value of a built-in timer not using interruption so that the contents of control (each value stored in RAM) may not be changed in this stage is more desirable.

[0203] moreover, a predetermined period -- a game sphere -- cover -- it is set up from the time of passing through the position in which the member 37 is formed more than time until it reaches the pattern operation switch 38 concrete -- cover -- the distance L from the position in which the member 37 is formed to the pattern operation switch 38, and cover -- the fall time t in the meantime is expressed using the passage speed V_0 (for example, it asks experimentally) of the position in which the member 37 is formed, and gravitational acceleration g Therefore, a predetermined period is set up more than it.

[0204] You must be in the state where the pattern operation switch 38 can detect a game sphere in the predetermined period at least when switch detection processing is performed. Then, with the form of this operation, as shown in drawing 12, the capacitor 933 as a comparatively mass auxiliary drive power supply is connected to the input side of the converter IC 932 in the power supply substrate 920. Therefore, also at the time of an electric power supply halt to a game machine, a certain amount of period is maintained by the range which +12V supply voltage can switch drive, and operation of the pattern operation switch 38 is attained. The capacity of a capacitor is determined so that the period may become more than the above-mentioned predetermined period.

[0205] In addition, since input port and CPU314 are also driven with +5V power

supply created by the converter IC 932, comparatively long period operation of them has been attained also at the time of an electric power supply halt.

[0206] In Step S761, the initial value n which is equivalent to the counter for measurement for 2ms at the time for 2ms is set up. And the value of the counter for measurement is carried out $-one$ for 2ms until the value of the counter for measurement is set to 0 for 2ms (Step S762) (Step S763).

[0207] If the value of the counter for measurement is set to 0 for 2ms, the input check of the detecting signal of the pattern operation switch 38 will be performed. Specifically, the data inputted into predetermined input port are inputted (Step S764). Subsequently, clear data (00) are set (Step S765). Moreover, in port input data and this case, the input data from predetermined input port is set up as a "comparison value" (Step S766). Furthermore, the address of the switch timer for the pattern operation switch 38 is set to a pointer (Step S767).

[0208] And a comparison value is shifted to the right (the direction from a high order bit to a lower bit) while loading the switch timer which a pointer (the address of a switch timer is set up) points out (Step S768) (Step S769). A data setup of the input port 1 is carried out at the comparison value. And in this case, the detecting signal of the pattern operation switch 38 is extruded by the carry flag.

[0209] If the value of a carry flag is "1" (i.e., if the detecting signal of the pattern operation switch 38 is an ON state) (Step S770), the value of a switch timer will be added one time (Step S771). Clear data will be set to a switch timer if the value of a carry flag is "0" (i.e., if the detecting signal of the pattern operation switch 38 is an OFF state) (Step S772). That is, if a switch is an OFF state, the value of a switch timer will return to 0.

[0210] And in this example, if the value of a switch timer is not 2 (Step S773), the value of the counter for predetermined period measurement is carried out $-one$ (Step S475), and if the value is not 0, it returns to Step S461. On the other hand, if the value of a switch timer is 2 (Step S773), a pattern operation flag will be set (Step S774).

[0211] If the pattern operation switch 38 turns on within a predetermined period, a pattern operation flag will be set by the above processing. Since processing for saving the content of Backup RAM is performed after such switch detection processing, a pattern operation flag is surely set about the game sphere which passed the passage mouth with which the pattern operation switch 38 is formed. Therefore, it can avoid that the game sphere which is not detected with the pattern operation switch 38 will be in the state where it was caught by sphere receptacle crevice 39a of the flare-part material 39, and it is prevented that conflict arises in the control state saved.

[0212] Moreover, in the above-mentioned switch detection processing, timer processing which used the counter for between patent periods is performed. That is, when the check of the detection output of the pattern operation switch 38 is performed every 2ms and ON detection is carried out twice continuously, it is

considered that the pattern operation switch 38 certainly turned on. Namely, a predetermined game medium detection judging period (period for judging the existence of detection of a game medium in processing at the time of an electric power supply halt.) In this example, when ON detection is carried out succeeding the period order for 2ms or more twice, it is considered that one game sphere passed. As mentioned above, since it is made it to be considered for that the pattern operation switch 38 certainly turned on when ON detection is carried out twice continuously, it is prevented that switch-on detection will be made accidentally and it becomes possible [detecting the passed game sphere certainly].

[0213] In addition, with the form of this operation, although switch detection processing of only the pattern operation switch 38 was performed, you may perform switch detection processing with the same said of V winning-a-prize switch 41 and the count switch relevant to a switch or a large winning-a-prize mouth of a winning-a-prize mouth. Moreover, you may perform switch detection processing same about other winning a prize. Even when a power failure occurs immediately after a game sphere wins a prize of a winning-a-prize mouth, in also performing such an on-check, the winning a prize is detected certainly and reflected in the game state saved.

[0214] If a predetermined period passes (i.e., if the value of the counter for predetermined period measurement is set to 0) (Step S776), the store of the specification value with backup (this example "55H") will be carried out to a backup flag (Step S781). The backup flag is formed in the backup RAM field. Subsequently, parity data are created (Steps S782-S791). That is, first, clear data (00) are set to a checksum data area (Step S782), and a checksum calculation starting address is set to a pointer (Step S783). Moreover, the number of times of checksum calculation is set (Step S784).

[0215] And the exclusive OR of the contents of a checksum data area and the contents of the RAM field which a pointer points out is calculated (Step S785). While carrying out the store of the result of an operation to a checksum data area (Step S786), the value of a pointer is increased one (Step S787), and the value of the number of times of checksum calculation is subtracted one time (Step S788). Processing of Steps S785-S788 is repeated until the value of the number of times of checksum calculation is set to 0 (Step S789).

[0216] If the value of the number of times of checksum calculation is set to 0, CPU314 will reverse the value of each bit of the contents of a checksum data area (Step S790). And the store of the data after reversal is carried out to a checksum data area (Step S791). This data turns into parity data checked by the power up. Subsequently, an access prohibition value is set as a RAM access register (Step S792). Henceforth, access of built-in RAM 55 becomes impossible.

[0217] In addition, with the form of this operation, power supply backup of all the RAM fields where the data used in game control processing are stored is carried out. Therefore, the RAM access prevention processing for not rewriting the generation processing of a checksum which shows whether the contents are saved surely, and

its contents is equivalent to the processing for saving a game state.

[0218] If an access prohibition value is set as a RAM access register, CPU314 will go into a standby state (loop state). Therefore, it will be in the state of carrying out nothing until a system reset is carried out.

[0219] In addition, with the form of this operation, although processing was performed according to NMI at the time of an electric power supply halt, a power off signal may be connected to the mask possible terminal of CPU314, and processing may be performed by mask possible interrupt processing at the time of an electric power supply halt. Moreover, a power off signal may be inputted into input port, and processing may be performed according to the check result of input port at the time of an electric power supply halt.

[0220] Moreover, although preservation processing of a register was performed to the beginning of the processing started according to a power off signal with the gestalt of this operation, when not using a register in switch detection processing, register preservation processing can be carried out after execution of switch detection processing (i.e., before processing of calculation of a setup of a backup flag, and a checksum). In this case, it can be considered at the time of an electric power supply halt that register preservation processing, backup flag setting processing, and checksum calculation processing are processings. Furthermore, even if it is the case where some registers are used in switch detection processing, about the register which is not used, register preservation processing can be performed before processing of calculation of a setup of a backup flag, and a checksum.

[0221] Hereafter, game state restoration processing is explained. Drawing 43 is a flow chart which shows an example of the game state restoration processing shown in step S9 of drawing 14. In this example, CPU314 returns the value saved at Backup RAM to each register (Step S91). And the game state at the time of a power failure is checked, and it is made to restore based on the data saved at Backup RAM (Step S92). Moreover, according to the value of the pattern process flag saved also in power off, the control command corresponding to the advance situation of the pattern process processing at the time of power off is sent out to the display-control substrate 800, the ramp-control substrate 350, and the sound control board 700 (Step S93).

[0222] As mentioned above, in game state restoration processing, while state restoration of various electrical parts is performed according to the restored internal state, the control command (control command for producing the control state at the time of power off) for returning a control state to the state at the time of power off is sent out to the display-control substrate 800, the ramp-control substrate 350, and the sound control board 700. Such control command may be a restoration command which shows that power supply restoration was carried out, even if it is one or more control command sent out at the end for example, before power off (when the game state is backed up by the sub substrate side). If a restoration command's is received in the case of the restoration after becoming power off

during the display of a change pattern in this case, what is necessary is just made to indicate the halt pattern of the pattern which was indicating by change in the display-control substrate 800 at the time of power off by blink.

[0223] If a game state is returned to the state at the time of power off, in order that CPU314 may return interruption permission / prohibition state at the time of the last power off, with the form of this operation, the value of the parity flag saved at Backup RAM will be checked (Step S95). If a parity flag is an OFF state, an interruption permission setup will be performed (Step S96). However, if a parity flag is an ON state, game state restoration processing will be ended as it is (with the interrupt inhibition state set up at Step S1). That a parity flag is an ON state means that it was in the interrupt inhibition state at the time of the last power off, as shown in Step S752 in drawing 40 . Therefore, interruption permission is not made when a parity flag is an ON state.

[0224] Although a game state returns to the state before the last current supply halt by game state restoration processing, since the starting sphere pilot switch 19 is not valid until switch processing (Step S21) is started, predetermined period delay of the start of a drive of a motor 62 is carried out, and after the starting sphere pilot switch 19 becomes effective, it controls by this example so that rotation operation of body of revolution 16 is resumed. Therefore, when the starting sphere pilot switch 19 immediately after restoration is still invalid, a game sphere can prevent passing the starting sphere pilot switch 19.

[0225] Moreover, a pattern is displayed for the game state before a current supply halt in the adjustable drop 9. When it is in the waiting state waiting for detection of V winning-a-prize switch 41 after open operation of the game sphere by the flare-part material 39 is completed Since it is possible that a game sphere wins a prize when it is in a state with invalid V winning-a-prize switch 41, Even if a game state is restored in the game state before the last current supply halt by game state restoration processing, detection of V winning-a-prize switch 41 is not carried out, but it is possible to give a game person disadvantageous profit, without being in a right generating state. Therefore, the main substrate 310 sends out the ramp-control command and sound control command which show abnormalities, and in spite of having restored to the detection waiting state of V winning-a-prize switch 41, when there is no detection of V winning-a-prize switch 41, it controls by this example so that unusual information is carried out by a lamp and sound. This unusual information is continuously performed until a halt pattern next hits and it becomes a pattern, or until a game sphere is detected by the discharge switch 44. Thus, when constituted, in spite of surely having displayed the pattern in the adjustable drop 9, it can tell to a game salesclerk etc. that there is no detection of V winning-a-prize switch 41, and it will not be in a right generating state. Therefore, since it becomes possible to request the disposal for making a right generating state shift to an amusement center side etc., it becomes possible to avoid disadvantageous profit of a game person.

[0226] Drawing 44 is a flow chart which shows the main processing which CPU801 for display controls performs. In main processing, initialization processing for first performing initial setting of 2ms timer for deciding the clearance of a RAM field, a setup of various initial value, and the starting interval of a display control etc. is performed (Step S701). Then, with the gestalt of this operation, CPU801 for display controls shifts to the loop processing which checks the surveillance (Step S703) of a timer-interruption flag. Within a loop, the random number update process for a display (update process of the counter which generates the random number for a display) is performed (Step S702). And if a timer interruption occurs as shown in drawing 45, CPU801 for display controls will set a timer-interruption flag (Step S711). In main processing, if the timer-interruption flag is set, CPU801 for display controls will clear the flag (Step S704), and will perform the following adjustable display-control processings.

[0227] In addition, with the gestalt of this operation, a timer interruption presupposes that it starts every 2ms. That is, adjustable display-control processing is started every 2ms. Moreover, although only a flag set is made and concrete adjustable display-control processing is performed in main processing with the gestalt of this operation in timer-interruption processing, you may perform adjustable display-control processing by timer-interruption processing.

[0228] In adjustable display-control processing, CPU801 for display controls analyzes the received display-control command first (command analysis executive operation : step S705). Subsequently, CPU801 for display controls performs display-control process processing (Step S708). In display-control process processing, the process corresponding to the present control state is chosen and performed among each process according to the control state. Then, it returns to Step S702.

[0229] Next, the display-control command reception from the main substrate 310 is explained. Drawing 46 is explanatory drawing showing the example of 1 composition of the command receive buffer for storing the display-control command received from the main substrate 310. In this example, the command receive buffer of the ring buffer form which can six-piece store the display-control command of 2-byte composition is used. Therefore, a command receive buffer consists of 12 bytes of fields of the receiving command buffers 1-12. And the command receiving number counter which shows in which field the received command is stored is used. A command receiving number counter takes the value of 0-11. In addition, you may not necessarily be ring buffer form, for example, it is good in a pattern specification command storing field also considering command storing fields, such as two pieces ($2 \times 2 = 4$ byte command receive buffer) and the other change pattern specification, as buffer composition like one piece ($2 \times 1 = 2$ byte command receive buffer). Also in sound control means and a ramp-control means, it is good similarly as a buffer form which is not ring buffer form. In this case, a display-control means, sound control means, and a ramp-control means are controlled based on the newest command stored in storing fields, such as a change pattern. Thereby, it can respond to

directions promptly from the main substrate 310.

[0230] Drawing 47 is a flow chart which shows the display-control command reception by interrupt processing. The INT signal for the display controls from the main substrate 310 is inputted into the interruption terminal of CPU801 for display controls. For example, if the INT signal from the main substrate 310 is turned on, interruption will start in CPU801 for display controls. And the reception of the display-control command shown in drawing 47 is started.

[0231] In the reception of a display-control command, CPU801 for display controls evacuates each register to a stack first (Step S670). In addition, although CPU801 for display controls will be automatically set as an interrupt inhibition state if interruption occurs, when CPU which will not be in an interrupt inhibition state automatically is used, it is desirable to publish an interrupt inhibition instruction (DI instruction) before execution of processing of Step S670. Subsequently, data are read from the input port currently assigned to the display-control command entry of data (Step S671). And it checks whether it is the 1st byte in the display-control command of 2-byte composition (Step S672).

[0232] It is checked by whether the head bit of the received command is "1" whether it is the 1st byte. It must be MODE data of the display-control commands which are 2-byte composition (the 1st byte) that a head bit is "1" (refer to drawing 25). Then, CPU801 for display controls is stored in the receiving command buffer which the command receiving number counter in a receive buffer field shows the received command noting that it will receive the 1st effective byte, if a head bit is "1" (Step S673).

[0233] If it is not the 1st byte in a display-control command, it will check whether the 1st byte has already been received (Step S674). It is checked by whether data effective in a receive buffer (receiving command buffer) are set up whether it has already received.

[0234] When the 1st byte is already received, it checks whether the head bit of the received 1 byte is "0." And it stores in the receiving command buffer which the command receiving number counter +1 in a receive buffer field shows the received command noting that the 2nd effective byte will be received, if a head bit is "0" (Step S675). It must be EXT data of the display-control commands which are 2-byte composition (the 2nd byte) that a head bit is "0" (refer to drawing 25). In addition, processing will be ended if the head bit of the data with which the check result in Step S674 already received the 1st byte, out of which it came and which were received as the 2nd byte in a certain case is not "0."

[0235] In Step S675, storing of the 2nd byte of command data adds 2 to a command receiving number counter (Step S676). And it checks whether a command receiving counter is 12 or more (Step S677), and with 12 [or more], a command receiving number counter is cleared (Step S678). Then, it returns (Step S679) and the evacuated register is set as interruption permission (Step S680).

[0236] A display-control command is 2-byte composition, and consists of receiving

sides possible [distinction] immediately the 1st (MODE) byte and the 2nd (EXT) byte. That is, it is detectable immediately in a receiving side whether the data as EXT were received for whether the data as MODE were received with a head bit. Therefore, as mentioned above, it can judge easily whether it is having received proper data. In addition, this is the same also about expenditure control command, a ramp-control command, and sound control command.

[0237] Drawing 48 is a flow chart which shows the example of command analysis processing (Step S705). Although the display-control command received from the main substrate 310 is stored in a receiving command buffer, in command analysis processing, the content of the command stored in the receiving command buffer is checked. In addition, same processing is performed also in the expenditure control board 370, the ramp-control substrate 350, and the sound control board 700.

[0238] In command analysis processing, CPU801 for display controls checks whether the display-control command from the main substrate 310 stored in the receiving command buffer is stored first (Step S681). It is judged when whether it is stored or not compares the value and read-out pointer of a command receiving counter. The case where both are in agreement is a case where the receiving command is not stored. When the receiving command is stored in the command receive buffer, CPU801 for display controls reads a receiving command from a command receive buffer (Step S862). In addition, if it reads, the value of a read-out pointer will be carried out +one.

[0239] If the read receiving command is a right generating state start command (refer to drawing 27) (Step S683), CPU801 for display controls will set a right generating state flag (Step S684). If the read receiving command is a right generating state quit command (refer to drawing 27) (Step S685), CPU801 for display controls will reset a right generating state flag (Step S686). In addition, a right generating state flag is a flag reset after it is set when it changes into a right generating state, and a right generating state is completed, for example, is memorized by RAM with which the display-control substrate 800 is equipped.

[0240] If the read receiving command is a left figure handle specification command (Step S687), the EXT data of the command will be stored in a left halt pattern storage area (Step S688), and a corresponding effective flag will be set (Step S689). In addition, it can be immediately recognized by the 1st (MODE data) byte in 2 bytes of display-control command whether it is a left figure handle specification command. Similarly, if the read receiving command is a right figure handle specification command (Step S687), the EXT data of the command will be stored in a right halt pattern storage area (Step S688), and a corresponding effective flag will be set (Step S689). In addition, the right-and-left halt pattern storage area is established in RAM with which the display-control substrate 800 is equipped.

[0241] If the read receiving command is a change pattern command (Step S690), CPU801 for display controls will store the EXT data of the command in a change pattern storage area (Step S691), and will set a change pattern receiving flag (Step

S692). In addition, the change pattern storage area is established in RAM with which the display-control substrate 800 is equipped. And when the receiving commands read at Step S682 are other display-control commands, the flag corresponding to a receiving command is set (Step S693).

[0242] Drawing 49 is explanatory drawing showing the random number for a display which CPU801 for display controls treats. As shown in drawing 49, with the gestalt of this operation, there is a random number for a hit preliminary announcement as a random number for a display. The random number for a hit preliminary announcement is for determining whether warn by hitting.

[0243] Drawing 50 is a flow chart which shows the display-control process processing (Step S708) in the main processing shown in drawing 44. In display-control process processing, processing of either of Steps S801-S805 is performed according to the value of a display-control process flag. The following processings are performed in each processing.

[0244] Waiting processing for display-control command reception (Step S801): Check whether the display-control command (change pattern command) which can specify change time has been received by command receive-interrupt processing. It is checked whether the flag which specifically shows that the change pattern command was received has been set. Such a flag is set when the receiving command stored in the receiving command buffer is a change pattern command.

[0245] Complete-diagram handle change start processing (Step S802): Determine the content of control at the time of presupposing that the determination of whether to perform a hit preliminary announcement and a preliminary announcement are performed. Moreover, it controls so that change of a right-and-left pattern is started.

[0246] Pattern change Naka processing (Step S803): While controlling the change timing of each upset condition (fluctuation velocity, a background, character) which constitutes a change pattern, supervise the end of change time. Moreover, halt control of a right-and-left pattern is performed.

[0247] Waiting setting processing for a complete-diagram handle halt (Step S804): Perform control which will stop change of a pattern and will display a halt pattern (definite pattern) at the time of the end of change time if the display-control command (definite command) which directs a complete diagram handle halt is received.

[0248] Display processing in a right generating state (Step S805): Control the display in a right generating state (the display under great success is included).

[0249] Drawing 51 is a flow chart which shows the waiting processing for display-control command reception (Step S801). In the waiting processing for display-control command reception, it checks whether CPU801 for display controls has received first the display-control command which can specify change time (Step S811). With the gestalt of this operation, the display-control command which can specify change time is either of the change pattern specification commands (change

pattern specification #1- change pattern specification XX-1) shown in drawing 27 . When the display-control command which can specify change time is received, the value of a display-control process flag is changed into the value corresponding to complete diagram handle change start processing (Step S802) (Step S812).

[0250] When fluctuating a pattern, the display-control commands first transmitted to the display-control substrate 800 from the main substrate 310 are the command which shows change time, and a command which specifies the halt pattern of a right-and-left pattern. They are stored in the definite command buffer.

[0251] Here, the sending-out gestalt of the command which specifies the halt pattern of the change pattern command and right-and-left pattern which show change time is explained. The command which specifies the halt pattern of the change pattern command and right-and-left pattern which show change time is transmitted in the display-control command control processing mentioned above. In case these commands are sent out, as shown in drawing 52 , INT data, the command data 1, and the command data 2 are set as the command transmitting table which the command transmitting number counter has pointed out by CPU314. First, the 1st command data (command data for specifying the change pattern set as the command transmitting table +0) constituted with the three above-mentioned data is transmitted. Subsequently, in the display-control command control processing performed (since the repeat period to which the built-in CTC of CPU314 generates a timer interruption repeatedly is set as 2ms with the gestalt of this operation), the following command data (command data for specifying the special pattern left halt pattern set as the command transmitting table +1) are transmitted between the following 2ms. And if such processing is repeated and a pattern command transmitting pointer points to a termination code, it will be in the state where command data are not transmitted until a command transmitting table is effectively specified with a pattern command transmitting pointer. Thus, it is received by the command reception mentioned above and the transmitted command data are stored in a receiving command buffer. In addition, each value which shows the command shown in drawing 52 is an example, and 81 (H) which shows a right-and-left pattern, and 83 (H) are the commands for displaying "1" and "3" on the adjustable drop 9, respectively.

[0252] When the display-control command which can specify change time is not received, CPU801 for display controls checks whether a control state is in a right generating state (Step S813). This check is performed by checking whether the right generating state flag is set. When a control state is in a right generating state, the value of a display-control process flag is changed into the value corresponding to display processing in a right generating state (Step S805) (Step S814).

[0253] Drawing 53 is a flow chart which shows the complete diagram handle change start processing (Step S802) in display-control process processing. In complete diagram handle change start processing, CPU801 for display controls first sets the value which added the predetermined time (for example, 0.1 seconds) to the change

time according to the display-control command as a supervisory timer (Step S840). In addition, predetermined processing is performed, when the command which specifies a complete diagram handle halt is not able to be received, before the supervisory timer carried out the time-out. Subsequently, CPU801 for display controls checks whether performing a preliminary announcement from CPU314 of the main substrate 310 is notified (Step S841). If the value of the random number for a hit preliminary announcement is 0 when warning, it will warn by hitting in the mode (referring to drawing 23) of the great success preliminary announcement 1, and it will warn by hitting, if the value of the random number for a hit preliminary announcement is 1, and hitting in the mode (referring to drawing 23) of preliminary announcement 2 (Step S842).

[0254] Thus, since it determines whether game control means determine whether warn by hitting, and warn by CPU801 for display controls hitting in which mode, the load which the display control of game control means takes also from this point is mitigated. In addition, although the sound according to the display is generally emitted from a loudspeaker 29 when the display of a hit preliminary announcement is made, game control means transmit the command which makes preliminary announcement sound utter to the sound control board 700 to the display timing of a hit preliminary announcement.

[0255] In addition, although two kinds of hit preliminary announcements were illustrated, there may be a hit preliminary announcement varieties further here. Moreover, when two or more preliminary announcement modes are used, the high preliminary announcement of the probability that a hit will occur, and the probability that a hit will occur may divide into a low preliminary announcement. Furthermore, it is good also as a preliminary announcement per probability changing in the preliminary announcement used when possibility that a hit will arise in a probability-changing figure is high.

[0256] Moreover, it is determined that the process table according to the selected change pattern is used for CPU801 for display controls (Step S843). Each upset condition in the change pattern (change period in fluctuation velocity or its speed etc.) is set to each process table. Moreover, each process table is set as ROM. Moreover, CPU801 for display controls starts a change time timer (Step S844). And change of a pattern is started (Step S845) and the value of a display-control process flag is made into the value corresponding to processing during pattern change (Step S846).

[0257] Drawing 54 is a flow chart which shows processing (Step S803) during pattern change. In processing, it checks whether the change time timer has carried out the time-out of CPU801 for display controls during pattern change (Step S851). When a change time timer carries out a time-out, the value of a display-control process flag is changed into the value corresponding to the waiting processing for a complete diagram handle halt (Step S804) (Step S852).

[0258] Drawing 55 is a flow chart which shows the waiting processing for a complete

diagram handle halt (Step S804). In the waiting processing for a complete diagram handle halt, it checks whether CPU801 for display controls has received the display-control command which directs a complete diagram handle halt (Step S861). If the display-control command which directs a complete diagram handle halt is received, control which stops a pattern in the halt pattern memorized will be performed (Step S862). When the display-control command which specifies a complete diagram handle halt is not received, it checks whether the supervisory timer is carrying out the time-out (Step S863). When a time-out is carried out, it judges that a certain abnormalities occurred and control which displays an error screen on the adjustable drop 9 is performed (Step S864).

[0259] If Step S862 is processed, CPU801 for display controls will set the value of a display-control process flag as the value corresponding to the waiting processing for display-control command reception (Step S801) (Step S865).

[0260] Drawing 56 is a flow chart which shows display processing in a right generating state (Step S805). In a display among a right generating state, CPU801 for display controls checks [of the control on which the display in connection with a right generating state is displayed to the adjustable drop 9] first whether it is under execution (Step S871). This check is performed according to the state of a check flag during the display which shows whether the display in connection with a right generating state is performed. During a display, a check flag is set after processing of Step S874 mentioned later and Step S875, and is reset after processing of Step S876 mentioned later and Step S878. If the display control in connection with a right generating state is performing, CPU801 for display controls will continue the display control in connection with a right generating state, and will perform it (Step S872).

[0261] If the display control in connection with a right generating state is not performing [be / it], CPU801 for display controls will check the state of an interruption display flag by this example, in order to check whether the display in connection with a right generating state is interrupted (Step S873). When the adjustable display based on [in an interruption display flag] a change pattern command to the inside of a right generating state is performed It is set (when having received the change pattern command at Step S878 is specifically checked). When the adjustable display based on the change pattern command in a right generating state is completed, it is the flag reset (when it is specifically checked at Step S873 that an interruption display flag is ON). If an interruption display flag is ON, CPU801 for display controls will resume execution of the display control in connection with a right generating state (Step S874). If an interruption display flag is not ON (it is the case where it newly changes into a right generating state in this case), CPU801 for display controls will start the display control in connection with a right generating state (Step S875). The display directions made to VDP803 in order to make it specifically display according to the display pattern in connection with the right generating state defined beforehand are continued, (Step S872) resumed or (Step S874) started (Step S875). Then, VDP803 creates the image data of the directed

display. Moreover, image data is compounded with a background image.

[0262] Subsequently, it checks whether the right generating state has ended CPU801 for display controls (Step S876). CPU801 for display controls judges whether the right generating state was completed with the gestalt of this operation, for example based on the state of a right generating state flag.

[0263] If the right generating state is completed, CPU801 for display controls will set the value of a display-control process flag as the value corresponding to the waiting processing for display-control command reception (Step S801), after terminating the predetermined display in connection with a right generating state (Step S877). If the right generating state is not completed, it checks whether CPU801 for display controls has received the viewing command (change pattern command) which can specify change time (Step S878). If the change pattern command is received, while stopping the display in connection with a right generating state, the value of a display-control process flag is set as the value corresponding to complete diagram handle change start processing (Step S802) (Step S879).

[0264] If the right generating state is not completed, CPU801 for display controls checks whether the display-control command (change pattern command) which can specify change time has been received like Step S811 mentioned above (Step S877). If the change pattern command is received, CPU801 for display controls will set the value of a display-control process flag as the value corresponding to complete diagram handle change start processing (Step S802) (Step S878).

[0265] Drawing 57 is explanatory drawing showing an example of the execution timing of adjustable display processing based on the change pattern command in a right generating state. As shown in drawing 57 (A), CPU801 for display controls will stop the display in connection with a right generating state, if a change pattern command is received while performing control for performing the display in connection with a right generating state. Subsequently, CPU801 for display controls starts execution of the adjustable display control based on the received change pattern command. After the adjustable display control based on the received change pattern command is completed, CPU801 for display controls resumes the control for performing the display in connection with a right generating state. In addition, while interrupting the display in connection with a right generating state when a change pattern command is received during execution of the display control in connection with a right generating state as shown in drawing 57 (B), the running state of the display control in connection with a right generating state is saved, and you may make it resume the display control in connection with a right generating state from the place interrupted after the end of an adjustable display control.

[0266] As explained above, when a change pattern command is received during execution of the display control in connection with a right generating state, the display control in connection with a right generating state stops or interrupts, and even if it is the case where it is controlled by having considered as the composition which resumes the display control in connection with a right generating state after

the end of the adjustable display control based on a change pattern command by the right generating state, the adjustable display of a pattern can perform to an adjustable drop 9. Therefore, in the display-control substrate 800, control based on a change pattern command can be appropriately performed now in a right generating state. Therefore, in the 3rd sort pachinko game machine which performs an adjustable display control even if it is among a right generating state, even if it is the case where it considers as the composition which forms the display-control substrate 800 separately [the main substrate 310], it becomes possible to perform the exact display control in a right generating state.

[0267] Next, operation of production control means other than a display-control means is explained. First, operation of the ramp-control means as emitter control means containing CPU351 for ramp control carried in the ramp-control substrate 350 which is an example of production control means is explained.

[0268] Drawing 58 is a flow chart which shows the main processing which CPU351 for ramp control performs. CPU351 for ramp control performs initialization processing which initializes RAM, an output port, etc. including a register and a work area first in main processing (Step S441). Subsequently, the ramp-control command received from the main substrate 310 is analyzed (Step S442: command analysis processing). Moreover, processing which updates a random number according to the content of the received ramp-control command is performed (Step S443).

[0269] Subsequently, CPU351 for ramp control performs command execution processing which is processing of changing the lamp data to be used according to the received ramp-control command (Step S444). In addition, the ramp-control command from the main substrate 310 is incorporated by interrupt processing started according to the input of an INT signal, and is stored in the input buffer currently formed in RAM.

[0270] Then, with the form of this operation, CPU351 for ramp control shifts to the loop processing which supervises a timer-interruption flag (Step S445). And if a timer interruption occurs as shown in drawing 59 , CPU351 for ramp control will set a timer-interruption flag (Step S451). In main processing, if the timer-interruption flag is set, while CPU351 for ramp control clears the flag (Step S446), lamp process update process and port output processing will be performed (Steps S447 and S448).

[0271] The lighting pattern of the lamp and Light Emitting Diode by which blink control is carried out according to advance of a game is controlled by the form of this operation according to the lamp data stored in ROM. Lamp data are prepared for every kind of control pattern (prepared for every control command about every control command which shows the kind of change pattern specification shown in drawing 28 , and the game production of others which are sent out from game control means according to a game advance situation). The data in which the period (process timer value) of the data in which turning on or switching off a lamp and Light Emitting Diode is shown and lighting, or putting out lights is shown are set to lamp data. That is, the data in which the lighting pattern of an emitter is shown are

stored in the data area for control.

[0272] In a lamp process update process, if subtraction processing of the value of a timer in which initial setting of the value according to the process timer value was carried out is performed and the timer carries out a time-out, while it will be decided that it will be responding to the data set as the following address in lamp data, and making a lamp and Light Emitting Diode switch off or turn on, the process timer value according to the determination result is set as a timer. Moreover, since it is a time of the change of lighting/putting out lights being made when a process timer value is set as a timer, in port output processing, it is outputted to the output port to which the data for lighting or putting out lights correspond a lamp and Light Emitting Diode.

[0273] Moreover, with the form of this operation, a timer interruption presupposes that it starts every 2ms. That is, a lamp process update process and port output processing are started every 2ms.

[0274] Here, the address map of ROM carried in the ramp-control substrate 350 is explained. There are a data area for control and a control program field as ROM field. The initialization data table used on the occasion of initialization of a register, RAM, an output port, etc., the storage display Light Emitting Diode display table used on the occasion of lighting/putting-out-lights control of the winning-a-prize storage drop 10 etc., the lamp data mentioned later are stored in the data area for control. Moreover, a main processing program and each program of initialization processing, command recognition processing, and command execution processing are stored in a control program field, and the program of a specific lamp and Light Emitting Diode processing, a lamp process update process, port output processing, command receive-interrupt processing, and timer-interruption processing is stored in it.

[0275] Drawing 60 is explanatory drawing showing an example of the contents of the lamp data stored in the data area for control. With the form of this operation, the data in which the pattern of lighting of a lamp and Light Emitting Diode is shown are stored in the lamp data in the data area for control. The pattern of lighting of a lamp and Light Emitting Diode as shown in drawing 60 is set to the pattern of lighting of the lamp and Light Emitting Diode stored in lamp data corresponding to the change pattern command (80XX(H)). Moreover, in addition to this, when it is in a right generating state, the lamp data with which the pattern of lighting of a lamp and Light Emitting Diode used was stored are prepared. And in the lamp process update process (Step S447) in main processing, lighting/putting out lights of a lamp and Light Emitting Diode are controlled with reference to lamp data.

[0276] Drawing 61 is explanatory drawing showing an example of the execution timing of lighting/putting-out-lights processing of a lamp and Light Emitting Diode based on the change pattern command in a right generating state. in addition, the change pattern command which corresponded with the form of this operation — each production control board 800,350,700 — since it is considering as the composition which is alike, respectively and is sent out at a simultaneous term, as

shown in drawing 61, the display control by the display-control substrate 800 and the emitter control in the ramp-control substrate 350 synchronize, and are performed As shown in drawing 61 (A), by the ramp-control substrate 350, CPU351 for ramp control will suspend lighting/putting-out-lights control of the lamp and Light Emitting Diode in connection with a right generating state, if a change pattern command is received while performing lighting/putting-out-lights control of a lamp and Light Emitting Diode using the lamp data with which the pattern of lighting of the lamp and Light Emitting Diode in connection with a right generating state is stored. Subsequently, CPU351 for ramp control starts execution of lighting/putting-out-lights control of a lamp and Light Emitting Diode based on a change pattern command using the lamp data with which the pattern of lighting of a lamp and Light Emitting Diode according to the received change pattern command is stored. After lighting/putting-out-lights control of a lamp and Light Emitting Diode based on the received change pattern command is completed, CPU351 for ramp control resumes lighting/putting-out-lights control of a lamp and Light Emitting Diode using the lamp data with which the lighting pattern of the lamp and Light Emitting Diode in connection with a right generating state is stored.

[0277] In addition, while interrupting lighting/putting-out-lights control of the lamp and Light Emitting Diode in connection with a right generating state when a change pattern command is received during execution of lighting/putting-out-lights control of the lamp and Light Emitting Diode in connection with a right generating state as shown in drawing 61 (B) The running state of lighting/putting-out-lights control of the lamp and Light Emitting Diode in connection with a right generating state (For example, the execution table of the lamp data which were under execution) is saved. You may make it resume lighting/putting-out-lights control of the lamp and Light Emitting Diode in connection with a right generating state from the place (execution table of the saved lamp data) interrupted after the end of lighting/putting-out-lights control of a lamp and Light Emitting Diode based on a change pattern command.

[0278] As explained above, when a change pattern command is received during execution of the emitter control in connection with a right generating state By having considered as the composition which resumes the emitter control in connection with a right generating state after the end of the emitter control based on the change pattern command which was stopped or interrupted and received the emitter control in connection with a right generating state Even if it is the case where control in connection with a right generating state is being performed, lighting/putting-out-lights control of various emitters, such as the side lamp 27, based on a change pattern command can be performed. Therefore, in the ramp-control substrate 350, control based on a change pattern command can be appropriately performed now in a right generating state.

[0279] Moreover, since it is considering as the composition to which the change pattern command which specifies the corresponding contents of control is sent out at the period, synchronizing with the contents of a display of the adjustable drop 9

by control of the display-control substrate 800, lighting/putting-out-lights control of an emitter can be performed. Therefore, in the 3rd sort pachinko game machine which performs an adjustable display control even if it is among a right generating state, even if it is the case where it considers as the composition which forms two or more production control boards 800,350, it becomes possible to perform exact emitter control in a right generating state.

[0280] Next, operation of the sound control means (voice-control means) containing CPU701 for sound control carried in the sound control board 700 which is an example of production control means is explained.

[0281] Drawing 62 is a flow chart which shows the main processing which CPU701 for sound control performs. CPU701 for sound control performs initialization processing which initializes RAM, an output port, etc. including a register and a work area first in main processing (Step S461). Subsequently, the sound control command which received from the main substrate 310 is analyzed (Step S462: command analysis processing). Moreover, processing which updates a random number according to the contents of the sound control command which received is performed (Step S463).

[0282] Subsequently, CPU701 for sound control performs command execution processing which is processing of changing the voice data to be used according to the contents of the sound control command which received (Step S464). In addition, the sound control command from the main substrate 310 is incorporated by interrupt processing started according to the input of an INT signal, and is stored in the input buffer currently formed in RAM.

[0283] Then, with the form of this operation, CPU701 for sound control shifts to the loop processing which supervises a timer-interruption flag (Step S465). And if a timer interruption occurs as shown in drawing 63, CPU701 for sound control will set a timer-interruption flag (Step S471). In main processing, if the timer-interruption flag is set, while CPU701 for sound control clears the flag (Step S466), voice process update process and port output processing will be performed (Steps S467 and S468).

[0284] The voice pattern outputted from a loudspeaker according to advance of a game is controlled by the form of this operation according to the voice data stored in ROM. Voice data is prepared for every kind of control pattern (prepared for every control command about every control command which shows the kind of change pattern specification shown in drawing 29, and the game production of others which are sent out from game control means according to a game advance situation).

[0285] Moreover, the speech synthesis circuit 702 is controlled by the transfer request-signal (SIRQ), serial clock signal (SICK), and serial data signal (SI) and the transfer terminate signal (SRDY). The speech synthesis circuit 702 will interpret the data which consist of each SI which received by then as one data for voice reproduction, if it will incorporate 1 bit of SI at a time synchronizing with SICK if SIRQ is set to a low level, and SRDY is set to a low level.

[0286] The data according to the serial data signal outputted to the speech synthesis circuit 702 and the data in which the duration (process timer value) of the voice generated according to the data is shown are set to each voice data. That is, the data in which the output pattern from a sound generating means (this example loudspeaker) is shown are stored in the data for control.

[0287] In a voice process update process, if subtraction processing of the value of a timer in which initial setting of the value according to the process timer value was carried out is performed and the timer carries out a time-out, while changing into output voice according to the data set as the following address in voice data will be determined, the process timer value according to the determination result is set as a timer. Moreover, since it is a time of the change of output voice being made when a process timer value is set as a timer, in port output processing (Step S468), the data corresponding to new output voice are outputted to the speech synthesis circuit 702 through the output port for outputting data to the speech synthesis circuit 702.

[0288] Specifically, in port output processing, SIRQ is turned ON (low level), CPU701 for sound control outputs as SI the data (voice command) read from ROM (voice command data area) synchronizing with SICK, and if an output is completed, it will make SRDY a low level. The speech synthesis circuit 702 will generate the voice according to the received data, if SI receives data.

[0289] Moreover, with the gestalt of this operation, a timer interruption presupposes that it starts every 2ms. That is, a voice process update process and port output processing are started every 2ms.

[0290] Here, the address map of ROM carried in the sound control board 700 is explained. There are a data area for control and a control program field as ROM field. The initialization data table used in case a register, RAM, an output port, etc. are initialized is stored in the data area for control. Moreover, the command high order byte table on which the address of the program in which the processing according to the high order byte (MODE data) of sound control command is stored, and the address table according to MODE data are set up is stored in the data area for control. In command execution processing (Step S464), according to the MODE data of the sound control command which received, the content of a command high order byte table is referred to, and corresponding processing (program) is performed. In the processing, the data in the voice data selection table stored in the degree of a command high order byte table in the data area for control are specified according to an address table and the lower byte (EXT data) of the sound control command which received. And the voice data which the specified data point out is chosen.

[0291] Moreover, a main processing program and each program of initialization processing, command recognition processing, and command execution processing are stored in the control program field. Moreover, the program of voice address selection processing is also stored. Furthermore, a voice process update process, port output processing, command receive-interrupt processing, and timer-

interruption processing are stored in the control program field.

[0292] With the gestalt of this operation, the data in which it is shown, the data, i.e., the output voice, given to the speech synthesis circuit 702, are stored in the voice command data in the data area for control. And in the voice process update process (Step S469) in main processing, voice data is referred to and output voice is further controlled with reference to voice command data. Drawing 64 is explanatory drawing showing an example of the content of the voice data stored in the data area for control. With the gestalt of this operation, the data (voice command data) in which the pattern of a voice output is shown are stored in the voice data in the data area for control. As a voice output pattern stored in voice data, the pattern of a voice output as shown in drawing 64 is defined corresponding to the change pattern command (80XX(H)). Moreover, in addition to this, the voice data in which the pattern of the voice output in connection with a right generating state is stored is prepared. And in the voice process update process (Step S467) in main processing, a voice output is controlled with reference to voice data.

[0293] Drawing 65 is explanatory drawing showing an example of the execution timing of the voice output processing based on the change pattern command in a right generating state. In addition, the change pattern command which corresponded with the gestalt of this operation -- each production control board 800,350,700 -- since it is considering as the composition which is alike, respectively and is sent out at a simultaneous term, as shown in drawing 65, the display control by the display-control substrate 800 and the voice output control in the sound control board 700 synchronize, and are performed. As shown in drawing 65 (A), in the sound control board 700, CPU701 for sound control will stop the voice output control in connection with a right generating state, if a change pattern command is received while performing voice output control using the voice data in which the voice output pattern in connection with a right generating state is stored. Subsequently, CPU701 for sound control starts execution of the voice output control based on a change pattern command using the voice data in which the voice output pattern according to the received change pattern command is stored. After the voice output control based on the received change pattern command is completed, CPU701 for sound control resumes the voice output control using the voice data in which the voice output pattern in connection with a right generating state is stored.

[0294] In addition, as shown in drawing 65 (B), when a change pattern command is received during execution of the voice output control in connection with a right generating state. The running state of the voice output control in connection with a right generating state while interrupting the voice output control in connection with a right generating state (For example, the voice command data of the voice data which was under execution) are saved. You may make it resume the voice output control in connection with a right generating state from the place (saved voice command data of voice data) interrupted after the end of the voice output control based on a change pattern command.

[0295] As having explained above, when a change pattern command is received during execution of the voice output control in connection with a right generating state, the voice output control in connection with a right generating state suspends or interrupts, and even if it is the case are controlled by having carried out as the composition which resumes the voice output control in connection with a right generating state after the end of the voice output control based on a change pattern command by the right generating state, the voice output control based on a change pattern command can carry out. Therefore, in the sound control board 700, control based on a change pattern command can be appropriately performed now in a right generating state.

[0296] Moreover, since it is considering as the composition to which the change pattern command which specifies the corresponding content of control is sent out at the period, voice output control can be performed synchronizing with the content of a display of the adjustable drop 9 by control of the display-control substrate 800. Therefore, in the 3rd sort pachinko game machine which performs an adjustable display control even if it is among a right generating state, even if it is the case where it considers as the composition which forms two or more production control boards 800,700, it becomes possible to perform exact voice output control in a right generating state.

[0297] As explained above, the information that the change period of the pattern by which it is indicated by adjustable, and a halt pattern can be specified as the adjustable drop 9 is sent out to a display-control means from CPU314 of the game control means 310, i.e., the main substrate, and a display-control means controls the display and display change of a background or a character without regards to pattern change by the gestalt of this operation. Therefore, the number of the display-control commands sent out to a display-control means from game control means about one pattern change is reduced.

[0298] And game control means give the display-control command which shows a complete diagram handle halt to a display-control means, when a change period expires, and a display-control means decides a pattern with the display-control command which shows a complete diagram handle halt. Therefore, a pattern is certainly decided to the timing which game control means manage. When game control means relate to the change start of a pattern, and the information that change time can be specified, and the information about a halt pattern are transmitted, and a display-control means determines a change pattern uniquely or performs substitution control of a pattern etc. after that like the gestalt of this operation, most portion of a display control will be performed by the display-control means.

[0299] Then, since game control means cannot recognize a concrete change pattern, if they do not take any measures, either, they also have a possibility that change which shifted from the change time on which game control means decided may be performed. However, if game control means constitute so that the display-control

command which shows a complete diagram handle halt may be given to a display-control means when a change period expires, a pattern will be certainly decided at the time of the end of the change time on which game control means decided. Moreover, if it is made to perform an error message when the display-control command which directs a complete diagram handle halt is unreceivable, it will be recognized immediately that abnormalities arose.

[0300] Moreover, in order to make the adjustable drop 9 perform production corresponding to the content of a display by which it is indicated by adjustable with the gestalt of this operation as mentioned above It considers as the composition which sends out the change pattern command which corresponds also to other production control means, such as a ramp-control means and sound control means. Since a ramp-control means and sound control means are considering as the composition which performs production based on lamp data and voice data which are prepared corresponding to the received command The number of the display-control commands sent out to production control means from game control means about the production accompanying one pattern change is reduced.

[0301] In addition, with the gestalt of the above-mentioned operation, game control means transmitted the information which considers as the information that change time can be specified and shows 1 time of the whole change period to the display-control substrate. However, one change is divided among the two or more division, and you may make it transmit the pattern information in each section to a display-control means at the time of the start of each section. In this case, a display-control means may choose one change pattern from two or more change patterns which can be set from the pattern information received about each section in the period.

[0302] Moreover, as explained above, when each production control board 800,350,700 receives a change pattern command (80XX(H)) during execution of the production control in connection with a right generating state By having suspended or interrupted the production control in connection with a right generating state, and having considered as the composition which resumes the production control in connection with a right generating state after the end of the production control based on a change pattern command Even if it is the case where it is controlled by the right generating state, production control based on a change pattern command can be performed. Therefore, in each production control board 800,350,700, it becomes possible into a right generating state to perform control based on a change pattern command appropriately.

[0303] Moreover, since it is considering as the composition to which the change pattern command which specifies the corresponding content of control is sent out to each production control board 800,350,700 at the period as mentioned above, control about an emitter or a voice output can be performed synchronizing with the content of a display of the adjustable drop 9. Therefore, in the 3rd sort pachinko game machine which performs an adjustable display control even if it is among a

right generating state, even if it is the case where it considers as the composition which forms two or more production control boards 800,350,700, it becomes possible to perform exact production control in a right generating state.

[0304] In addition, with the gestalt of each operation mentioned above, when an indication in connection with a right generating state is given with the adjustable drop 9 Although it was considering as the composition which performs the display based on the change pattern command which was stopped or interrupted and received the display in connection with a right generating state when the display-control substrate 800 received the change pattern command (80XX(H)) In such a case, it compounds and may be made to perform the display in connection with a right generating state, and the display based on the received change pattern command simultaneously. To perform the display in connection with a right generating state in some display area as composition which classifies and displays the display area of the adjustable drop 9 in this case, and what is necessary is just made to perform the display based on a change pattern command in other display area.

[0305] Drawing 66 is explanatory drawing showing other examples of the execution timing of adjustable display processing based on the change pattern command in a right generating state. In this example, if a change pattern command is received while performing control for performing the display in connection with a right generating state, as shown in drawing 67, CPU801 for display controls While performing the display in connection with a right generating state in a part of display area (for example, display area 9c) of the adjustable drop 9, the adjustable display of the pattern based on the change pattern command received using a part of other display area (for example, display area 9a and 9b) of the adjustable drop 9 etc. is performed. In this case, the content of the display in connection with a right generating state should be made just to perform explanation, an alarm display, etc. of an action which extinguish a right from there being a possibility that a right may disappear depending on the display result of a pattern, and a subsequent game result, for example. And after the display of some [other] patterns of the display area of the adjustable drop 9 is completed, CPU801 for display controls resumes the control for performing the display in connection with a right generating state.

[0306] It becomes possible to perform the display based on the received change pattern command, continuing the composition which compounds and performs simultaneously the display in connection with a right generating state, and the display based on the received change pattern command, then the display in connection with a right generating state, as mentioned above. In addition, the display area of the adjustable drop 9 may be classified how.

[0307] Moreover, if a change pattern command (80XX(H)) is received with the gestalt of each operation mentioned above while the ramp-control substrate 350 is performing emitter control in connection with a right generating state Although considered as the composition which performs emitter control based on the change

pattern command which was stopped or interrupted and received the emitter control in connection with a right generating state. In such a case, it compounds and may be made to perform emitter control in connection with a right generating state, and emitter control based on the received change pattern command simultaneously. In this case, to classify the emitter controlled by lighting/putting-out-lights pattern in connection with a right generating state, and the emitter controlled by lighting/putting-out-lights pattern based on a change pattern command, and what is necessary is just made to perform emitter control. In this example, the lamp data with which the pattern of lighting of the lamp and Light Emitting Diode corresponding to the change pattern command (80XX(H)) received when it was not among a right generating state was stored are prepared, and also the lamp data with which the pattern of lighting of the lamp and Light Emitting Diode corresponding to the change pattern command received in the right generating state was stored are prepared. The pattern of lighting of the lamp and Light Emitting Diode corresponding to the change pattern command received in the right generating state. For example, some emitters (for example, emitter by the side of the game boards 1, such as the side lamp 27) are controlled by lighting/putting-out-lights pattern in connection with a right generating state. It considers as a pattern with which other emitters (for example, emitter by the side of frames, such as the game effect lamps 30a-30b) are controlled by lighting/putting-out-lights pattern based on a change pattern command.

[0308] Drawing 68 is explanatory drawing showing other examples of the execution timing of lighting/putting-out-lights processing of a lamp and Light Emitting Diode based on the change pattern command in a right generating state. As shown in drawing 68, by the ramp-control substrate 350, CPU351 for ramp control will suspend lighting/putting-out-lights control of the lamp and Light Emitting Diode in connection with a right generating state, if a change pattern command is received while performing lighting/putting-out-lights control of a lamp and Light Emitting Diode using the lamp data with which the pattern of lighting of the lamp and Light Emitting Diode in connection with a right generating state is stored. Subsequently, CPU351 for ramp control starts execution of lighting/putting-out-lights control of the lamp and Light Emitting Diode with which the control in connection with a right generating state and the control based on a change pattern command were compounded using the lamp data with which the pattern of lighting of the lamp and Light Emitting Diode at the time of receiving the above-mentioned change pattern command in a right generating state was stored. some emitters (for example, emitter by the side of the game boards 6, such as the side lamp 27) are controlled by lighting/putting-out-lights pattern in connection with a right generating state by this control, and other emitters (for example, emitter which is a frames side, such as the game effect lamps 30a-30c) are controlled by it by lighting/putting-out-lights pattern based on a change pattern command. And after lighting/putting-out-lights control of the lamp and Light Emitting Diode with which the control in connection

with a right generating state and the control based on a change pattern command were compounded is completed, CPU351 for ramp control resumes lighting/putting-out-lights control of the lamp and Light Emitting Diode in connection with the right generating state using the lamp data with which the pattern of lighting of the lamp and Light Emitting Diode in a right generating state is stored.

[0309] It becomes that it is possible in carrying out the control based on the change pattern command which received using other emitters, continuing the control in connection with a right generating state using the composition which compounds and performs lighting/putting-out-lights control of the lamp and Light Emitting Diode in connection with a right generating state, and lighting/putting-out-lights control of a lamp and Light Emitting Diode based on the received change pattern command, then some emitters as having mentioned above.

[0310] Moreover, if a change pattern command (80XX(H)) is received with the gestalt of each operation mentioned above while performing voice output control in connection with a right generating state by the sound control board 700 Although it is made to perform voice output control based on the change pattern command which was stopped or interrupted and received the voice output control in connection with a right generating state The voice output control in connection with a right generating state and the voice output control based on the received change pattern command are compounded, and it may be made to perform simultaneously. In this case, what is necessary is just to make it output the voice which compounded the voice output pattern in connection with a right generating state, and the voice output pattern based on a change pattern command. In this example, the voice data in which the voice output pattern corresponding to the change pattern command (80XX(H)) received when it was not among a right generating state was stored is prepared, and also the voice data in which the voice output pattern (this example output pattern of a synthesized speech) corresponding to the change pattern command at the time of receiving in a right generating state was stored is prepared. Let the voice output pattern corresponding to the change pattern command received in the right generating state be the voice output pattern which compounded the voice output pattern for example, in connection with a right generating state, and the voice output pattern based on a change pattern command.

[0311] Drawing 69 is explanatory drawing showing an example of the execution timing of the voice output processing based on the change pattern command in a right generating state. As shown in drawing 69 , CPU701 for sound control will stop the voice output control in connection with a right generating state, if a change pattern command is received while performing voice output control using the voice data in which the voice output pattern in connection with a right generating state is stored. Subsequently, CPU701 for sound control performs voice output control which outputs a synthesized speech using the voice data in which the voice output pattern corresponding to the change pattern command at the time of receiving in a right generating state was stored. After the voice output control based on the voice

data in which the synthesized-speech pattern was stored is completed, CPU701 for sound control resumes the voice output control in connection with the right generating state using the voice data in which the voice output pattern in a right generating state is stored.

[0312] In addition, that by which a part of voice (a sound source 1 – sound source 5) (a sound source 1 – sound source 3) which shows the right generating state where a synthesized speech is shown in drawing 70 (A), and the voice (a sound source 6, sound source 7) outputted in the case of pattern change were compounded is used. Moreover, for example, as shown in drawing 70 (B), that by which the voice (what lowered volume) which shows a right generating state, and the voice outputted in the case of pattern change were compounded is used. In addition, the composite rate and the ratio of output voice may be set up how.

[0313] The voice which shows a right generating state, and the voice outputted in the case of pattern change can output now at the period by having considered as the composition which outputs the composite tone which compounded the voice outputted as a result of the control in connection with a right generating state as mentioned above, and the voice outputted as a result of the control based on the received change pattern command. Moreover, since it considered as the composition which enlarges the output degree of the output voice based on the received change pattern command, it can report certainly that the control based on a change pattern command was started in the right generating state to a game person. In addition, you may be made to enlarge the output degree of the voice which shows conversely that it is in a right generating state. Thus, if constituted, there is nothing with the hindrance of control and the bird clapper in a right generating state, and control based on a change pattern command can be performed. Therefore, it can report that the right generating state is continuing to a game person, and can prevent making it recognize it as whether the right generating state was completed accidentally.

[0314] Moreover, although considered as the composition whose production control boards 350,700 of other change the content of control with the gestalt of each operation mentioned above synchronizing with the time of the start of the pattern change control performed in the display-control substrate 800 according to a change pattern command, you may make it change the content of control to other timing. For example, what is necessary is just to make it change to the control according to the change pattern command of the content of control of each production control board 350,700 to the timing (for example, for the stage when a preliminary announcement display is started in the adjustable drop 9 by the received change pattern command to be specified) by which the display about a hit preliminary announcement is started, when the content of a display of the adjustable drop 9 hits and it is warned. In this case, what is necessary is just to prepare beforehand the lamp data and voice data which perform such control in each production control board 350,700.

[0315] Thus, since it considered as the composition which starts the control based

on the change pattern command received to the timing to which a predetermined display is performed, control about the display can be performed to the timing to which the predetermined display was made by the adjustable drop 9. Control which hit by each production control means 350,700, and suited the preliminary announcement display to the timing which follows for example, by which the display of a hit preliminary announcement is started can be performed now.

[0316] Moreover, although the gestalt of each operation mentioned above explained the control mode of each production control board 800,350,700 at the time of inputting a change pattern command to each production control board 800,350,700 into the right generating state, you may be made to perform such control into other game states. For example, when a change pattern command inputs into each production control board 800,350,700, you may be made to perform various control which was mentioned above into a great success game state.

[0317] Moreover, although considered as the composition which performs control in other production control boards 350,700 with the gestalt of each operation mentioned above synchronizing with the content of the pattern change control performed in the display-control substrate 800 according to a change pattern command, when pattern change control is performed in a right generating state, it may be made control performing in a right generating state at other production control boards 350,700 continuously. As for the inside of a right generating state, in this case, the main substrate 310 should just consider as the composition which transmits a change pattern command only to the display-control substrate 800. Drawing 71 is a flow chart which shows an example of switch processing (S21) of the game control processing (refer to drawing 16) in this example. Drawing 72 is a flow chart which shows the example of the command transmitting table set up processing in this example.

[0318] In the switch processing shown in drawing 71 , CPU314 checks first whether it is under [right generating state] ***** (step S21a). This check is performed according to the state of a right generating state flag. A right generating state flag is set when it shifts to a right generating state, and when a right generating state is completed, it is reset. In step S21a, if it is not among a right generating state, it will check whether the specific sphere pilot switch 48 has turned on CPU314 (step S21b). When what the specific sphere pilot switch 48 turned on is checked, CPU314 sets a right generating state flag (step S21c).

[0319] If it is among a right generating state in step S21a, CPU314 will be supervising the number of times of great success, each switch, etc., and it will be checked whether the right generating state has been completed (Step S 21d). In addition, the starting sphere pilot switch 19 detects the number-of-times winning-a-prize sphere of predetermined in a right generating state, and a right generating state ends it, when the number of times of continuation of the great success beforehand defined by having carried out number-of-times opening of predetermined of the large winning-a-prize mouth is digested. Moreover, a right generating state is

ended when operation which generates a right further in a right generating state is performed (when V winning-a-prize switch 41 turns on in this example). When it is checked that the right generating state had been completed, CPU314 resets a right generating state flag (step S21e). And the state of other switches, such as adjustable winning-a-prize operation switch 22a, is for example usually checked, and processing (for example, the set/reset of the corresponding flag) according to the state is performed (Step S 21f).

[0320] A setup of a command transmitting table is set up in various processings of pattern process processing for example, etc. if needed. In being in predetermined game states, such as a right generating state, for example, in order to send out and twist a change pattern command to a predetermined sub substrate and to make it like, it controls by this example so that the corresponding command is not set as a command transmitting table. In each processing which CPU314 performs, command transmitting table set up processing shown in drawing 72 is called and performed, when it is going to set up a command transmitting table. In addition, you may make it incorporate the command transmitting table set up processing which shows a change pattern command in the control program with which processing set as a command transmitting table may be performed at drawing 72 .

[0321] In command transmitting table set up processing, CPU314 first checks whether the sub substrate of the transmission place of the command which it is going to set as a command transmitting table is the ramp-control substrate 350 or the sound control board 700 (Step S101). This check is performed by referring to the INT data of the command which it is going to set as a command transmitting table (refer to drawing 36). If the sub substrate of a transmission place is the ramp-control substrate 350 or the sound control board 700, CPU314 will check whether the command which it is going to set up is a change pattern command (Step S102). In this example, it is checked by whether MODE data are 80 (H). If the command which it is going to set as a command transmitting table is a change pattern command, it will check whether CPU314 is among a right generating state (if it is MODE data =80(H)) (Step S103). This check is performed by whether a right generating state flag is ON. If it is among a right generating state, processing will be finished without setting a command (change pattern command) as a command transmitting table.

[0322] When judged with the sub substrate of a transmission place not being the ramp-control substrate 350 or the sound control board 700 at Step S101, When judged with the command which it is going to set as a command transmitting table at Step S102 not being a change pattern command, Or when judged with it not being among a right generating state at Step S103, the control command which sends out CPU314 and is utterly is set as a command transmitting table (Step S104).

[0323] Thus, the change pattern command to the ramp-control substrate 700 and the sound control board 350 can prevent now being transmitted into a right generating state because it is made to perform command transmitting table set up

processing. Therefore, with the gestalt of this operation, since a change pattern command is sent out only to the display-control substrate 800 into a right generating state, while the adjustable display control in the adjustable drop 9 is performed, the control in a right generating state comes to be continued about emitter control or a sound output control. Therefore, suitable control in a right generating state also as composition which prepares two or more production control boards can be performed. If constituted in this way, it will become unnecessary moreover, to prepare much control command (for example, change pattern command sent out only to the display-control substrate 800 when it is control command with separate change pattern command 80XX(H) mentioned above and is in a right generating state).

[0324] In addition, although considered as the composition which does not transmit a change pattern command (80XX(H)) into the right generating state to the ramp-control substrate 350 and the sound control board 700 with the form of other operations mentioned above, the ramp-control substrate 350 and the sound control board 700 are good in a right generating state also as composition which does not reflect a change pattern command (80XX(H)) in control. In this case, in the main substrate 310, as processing of Step S104 is performed without judging Step S101 - Step S103 in the command transmitting table set up processing shown in drawing 72, the control command set as the command transmitting table is sent out one by one. Drawing 73 is a flow chart which shows the example of the command analysis processing performed by CPU351 for ramp control in this example. Moreover, drawing 74 is a flow chart which shows the example of the command analysis processing performed by CPU701 for sound control in the form of this operation.

[0325] Moreover, although it was considering as composition which is not reflected in control with the form of other operations mentioned above even if it was the case where a change pattern command was received in a right generating state, in the ramp-control substrate 350 and the sound control board 700, you may make it transmit the change pattern command which is not defined in the ramp-control substrate 350 and the sound control board 700 to each production control board 800,350,700. In this case, what is necessary is to form separately the change pattern command for the inside of the right generating state which specifies the same contents of control as the change pattern command (80XX(H)) mentioned above, and to define it only as the display-control substrate 800. Thus, since pattern control would be normally performed in the display-control substrate 800 and the command of the undefined will have been transmitted in the ramp-control substrate 350 and the sound control board 700 when the change pattern command for the inside of a right generating state is outputted to each production control board 800,350,700 if constituted, the received change pattern command will be disregarded.

[0326] According to the command analysis processing performed by CPU351 for ramp control shown in drawing 73, CPU351 for ramp control checks whether the ramp-control command from the main substrate 310 stored in the receiving

command buffer is stored first (step S442a). It is judged when whether it is stored or not compares the value and read-out pointer of a command receiving counter. The case where both are in agreement is a case where the receiving command is not stored. When the receiving command is stored in the command receive buffer, CPU351 for ramp control reads a receiving command from a command receive buffer (step S442b). In addition, if it reads, the value of a read-out pointer will be carried out +one.

[0327] If the read receiving command is a right generating state start command (refer to drawing 28) (step S442c), CPU351 for ramp control will set a right generating state flag (Step S 442d). If the read receiving command is a right generating state quit command (refer to drawing 28) (step S442e), CPU351 for ramp control will reset a right generating state flag (Step S 442f). In addition, a right generating state flag is a flag reset after it is set when it changes into a right generating state, and a right generating state is completed, for example, is memorized by RAM with which the ramp-control substrate 350 is equipped.

[0328] If the read receiving command is a change pattern command (Step S 442g), CPU351 for ramp control will check whether it is among a right generating state according to the state of a right generating state flag (Step S 442h). If it is not among a right generating state, CPU351 for ramp control will store the EXT data of the change pattern command in a change pattern storage area (step S442i), and will set a change pattern receiving flag (step S442j). (if a right generating state flag is not ON) In addition, the change pattern storage area is established in RAM with which the ramp-control substrate 350 is equipped. Step S In 442h, if it is among a right generating state, CPU351 for ramp control will discard the change pattern command, without storing EXT data (step S442k). (if a right generating state flag is ON) (elimination) And when the receiving commands read in step S442b are other ramp-control commands, the flag corresponding to a receiving command is set (Step S 442l.).

[0329] According to the command analysis processing performed by CPU701 for sound control shown in drawing 74 , CPU701 for sound control checks whether the sound control command from the main substrate 310 stored in the receiving command buffer is stored first (step S462a). It is judged when whether it is stored or not compares the value and read-out pointer of a command receiving counter. The case where both are in agreement is a case where the receiving command is not stored. When the receiving command is stored in the command receive buffer, CPU701 for sound control reads a receiving command from a command receive buffer (step S462b). In addition, if it reads, the value of a read-out pointer will be carried out +one.

[0330] If the read receiving command is a right generating state start command (refer to drawing 29) (step S462c), CPU701 for sound control will set a right generating state flag (Step S 462d). If the read receiving command is a right generating state quit command (refer to drawing 29) (step S462e), CPU701 for

sound control will reset a right generating state flag (Step S 462f). In addition, a right generating state flag is a flag reset after it is set when it changes into a right generating state, and a right generating state is completed, for example, is memorized by RAM with which the sound control board 700 is equipped.

[0331] If the read receiving command is a change pattern command (Step S 462g), CPU701 for sound control will check whether it is among a right generating state according to the state of a right generating state flag (Step S 462h). If it is not among a right generating state, CPU701 for sound control will store the EXT data of the change pattern command in a change pattern storage area (step S462i), and will set a change pattern receiving flag (step S462j). (if a right generating state flag is not ON) In addition, the change pattern storage area is established in RAM with which the sound control board 700 is equipped. Step S In 462h, if it is among a right generating state, CPU701 for sound control will discard the change pattern command, without storing EXT data (step S462k). (if a right generating state flag is ON) (elimination) And when the receiving commands read in step S462b are other ramp-control commands, the flag corresponding to a receiving command is set (Step S 462l.).

[0332] It can avoid performing control based on the change pattern command (80XX(H)) received in the right generating state in the ramp-control substrate 350 and the sound control board 700 with constituting as mentioned above. Therefore, it sets to the game machine with which the adjustable display control based on a change pattern command is performed in the display-control substrate 800 even if it is among a right generating state. When a game state is in a right generating state, even if it is the case where the change pattern command has been sent out towards the ramp-control substrate 350 or the sound control board 700 It is avoidable that control according to the change pattern command in a right generating state will be performed in the ramp-control substrate 350 and the sound control board 700. Therefore, the ramp-control substrate 350 and the sound control board 700 become possible [performing appropriately emitter control performed according to the game state in the letter of right generating, and voice output control].

[0333] Moreover, with the gestalt of other operations, it can determine now quickly further whether to be in the game state which should not be reflected in control about a predetermined command by easy processing by having considered [which was mentioned above] as the composition to judge whether it was among a right generating state according to the state of a right generating state flag in each production control board.

[0334] Moreover, with the gestalt of other operations, it can determine further whether be the command which should be quickly reflected in control by easy processing by having considered [which was mentioned above] as the composition to judge whether it was a change pattern command (80XX(H)) according to the content of MODE data.

[0335] In addition, although it was considering as composition which is not reflected

in control with the gestalt of other operations further even if it was the case mentioned above where a change pattern command was received in a right generating state, in the ramp-control substrate 350 and the sound control board 700, in a right generating state, it is good also as composition (it does not store in a command receive buffer) which does not receive a change pattern command. In this case, what is necessary is to grasp a game state with a right generating state flag, and just to constitute the ramp-control substrate 350 and the sound control board 700 in a right generating state, so that it may ignore without storing the transmitted command in a command receive buffer when it is checked that the change pattern command has been sent out from the main substrate 310 with MODE data.

[0336] moreover, with the gestalt of other operations mentioned above, and the gestalt of operation of further others into a right generating state, the change pattern command to the ramp-control substrate 350 and the sound control board 700 is not reflected by control. (For example, the production control board 350,700 side to which the main substrate 310 does not transmit a change pattern command receives and twists a change pattern command.) Or although the control based on it was performed and twisted and was made like even if it received the change pattern command by the production control board 350,700 side, you may make it impose such a limit into other game states. For example, it is among a right generating state, is the game machine with which an adjustable display control is not performed in the case of the game state which is not among a specific game state, and you may make it a game machine with which an adjustable display control is performed constitute in a specific game state, so that the change pattern command to the ramp-control substrate 350 and the sound control board 700 may not be reflected by control into a specific game state.

[0337] Moreover, although the judgment pattern type 3rd sort pachinko game machine 1 was made into the example and the gestalt of each operation mentioned above explained it, same processing of usually performing the display control of a pattern also with the pattern type 3rd sort pachinko game machine based on a change pattern command, a pattern specification command, and a pattern halt command etc. can be performed. Hereafter, the example of composition of the pattern type 3rd sort pachinko game machine is usually explained. Drawing 75 is the front view which usually saw the game board 101 of the pattern type 3rd sort pachinko game machine from the transverse plane. The game board 101 is attached in the main part of a pachinko game machine removable.

[0338] As shown in drawing 75, the guidance rail 102 for guiding the discharged hit ball is formed in the front face of the game board 101. Moreover, the game field 103 is established in the front face of the game board 101. The adjustable display 110 by the 7 segment Light Emitting Diode is formed near the center of the game field 103. The adjustable display 110 is attached in the front face of the game board 101 by the attachment substrate 111 currently formed in the tooth back. The LCD drop (liquid crystal display) 112 with which the adjustable display 110 has three pattern

display area, the "left", "inside", and the "right", 112a-112c is formed. Display window 111a which has a window frame surrounding the pattern display area 112a-112c is formed in the attachment substrate 111. The passage storage drop 114 which serves as the winning-a-prize mouth 113 from four Light Emitting Diodes is formed in the upper part of the attachment substrate 111. Also in this example, whenever there is passage detection by the starting sphere pilot switch 105 which makes four pieces an upper limit and mentions them later, the passage storage drop 114 increases every one turned-on display. And whenever an adjustable display with the adjustable display 110 is started, one turned-on display is reduced.

[0339] The starting sphere passage mouth 104 is formed in the lower part of the adjustable display 110. The hit ball which passed the starting sphere passage mouth 104 is detected by the starting sphere pilot switch 105 prepared in the starting sphere passage mouth 104. In addition, according to the starting sphere pilot switch 105 having detected the hit ball, it is controlled by the gestalt of this operation so that the pattern display area 112a-112c of the adjustable display 110 starts change. Moreover, the winning-a-prize mouth 106 is formed in the lower part of the starting sphere passage mouth 104. The winning-a-prize mouth 106 accepts the hit ball which passed the starting sphere passage mouth 104 as a winning-a-prize sphere.

[0340] Body of revolution 120 is arranged on the right-hand side of the adjustable display 110. It has the tie-down plate attached in the front face of the game board 101, an envelopment frame protrudes on the front face of the tie-down plate, and body of revolution 120 is making the structure by which a rotation drive is carried out in the direction of a clockwise rotation by the motor inside an envelopment frame. The **** crevice 121 in which one hit ball is accepted is formed in the periphery section of body of revolution 120. The **** crevice 121 is considered as the composition which can accept the hit ball which entered from the operation winning-a-prize mouth 122 which body of revolution 120 rotates and is formed in the upper part of an envelopment frame. The hit ball caught by the **** crevice 121 is led to the tooth back of a tie-down plate, and is detected by the operation sphere pilot switch 123. The great success state (one gestalt of a specific game state) where open control of the adjustable winning-a-prize sphere equipment 150 mentioned later is carried out because the operation sphere pilot switch 123 detects a hit ball in a right generating state comes to occur.

[0341] Adjustable winning-a-prize detection equipment 130 is formed in the method of left-hand side of the adjustable display 110. A winning-a-prize sphere is detected by the winning-a-prize sphere pilot switch 131 with adjustable winning-a-prize detection equipment 130. The adjustable winning-a-prize mouth 132 is usually formed in the upper-limit portion of adjustable winning-a-prize detection equipment 130. The pieces 133a and 133b of opening and closing of a right-and-left couple are formed in this common adjustable winning-a-prize mouth 132. Based on the drive of the solenoid which was allotted to the rear face of the game board 101 and which is not illustrated, change of the pieces 133a and 133b of opening and closing is enabled

between a tilting position and a vertical position. Moreover, the obstacle nail 134 which usually prevents winning a prize of the hit ball to the adjustable winning-a-prize mouth 132 is formed above the pieces 133a and 133b of opening and closing in a vertical position. Thereby, the pieces 133a and 133b of opening and closing will be in the tilting state of usually opening the adjustable winning-a-prize mouth 132, when the solenoid turns on, and when the solenoid turns off, they are [of usually closing the adjustable winning-a-prize mouth 132] perpendicular. The winning-a-prize sphere passage mouth 135 which passes caudad the hit ball detected by the winning-a-prize sphere pilot switch 131 is formed in the soffit portion of adjustable winning-a-prize detection equipment 130.

Since it became timeout time, translation result display processing is stopped.

*** NOTICES ***

Japan Patent Office is not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.*** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

EFFECT OF THE INVENTION

[Effect of the Invention] As the adjustable display time and the display result of identification information [in / an adjustable display / at least / by invention according to claim 1 / in game control means] It considers as composition including a contents determination means of a display to determine the definite identification information decided, and a command output means to output the control command for controlling an adjustable display to a display-control means. A command output means is based on the determination of the contents determination means of a display. the adjustable viewing command which can specify the adjustable display time of identification information at least as control command, and the identification information specification command which can specify definite identification information Since it is characterized by an output being possible at the time relevant to starting adjustable presenting of identification information based on an adjustable viewing command, and an output of the definite command which shows decision of identification information at the time relevant to terminating an adjustable display being possible Game control means can cut down the number of commands sent out to a display-control means, and can make the processing burden of game control means mitigate.

[0351] In invention according to claim 2, it has two or more viewing areas, and since it is considered as the composition to which game control means output the identification information specification command corresponding to each of two or more viewing areas while an adjustable display of identification information is possible for an adjustable display in each viewing area, it can specify the identification information displayed on each of two or more viewing areas.

[0352] In invention according to claim 3, since a display-control means checks of which classification it is control command according to the classification information

which shows the classification of control command and it is made to judge at least whether they are an adjustable viewing command, an identification information specification command, and a definite command, the classification of control command can be easily judged by easy processing, and the contents of processing which should be performed can be grasped quickly.

[0353] Since the contents of a display of 1 are determined from two or more kinds of contents of a display from which a display-control means differs according to the adjustable viewing command of 1 and the display result of an adjustable display is controlled by invention according to claim 4, game control means do not need to determine the contents of a display displayed by the adjustable display, it is not necessary to carry out command transmission, and it becomes possible to mitigate the processing burden of game control means.

[0354] In the special field detection means which the specific display result beforehand set to the adjustable display was drawn in invention according to claim 5, and was specially prepared in the field When a game sphere is detected, it considers as the composition which makes a right generating state occur, and game control means can cut down the number of commands sent out to a display-control means, and can make the processing burden of game control means mitigate also about the game machine of such composition.

[0355] In invention according to claim 6, since the 1st guidance operation which can guide a game sphere to a field specially, or a specially different guidance operation means from a field which can usually be guided to a field by which a game sphere can be guided in either of the 2nd guidance operation is included according to the display result of an adjustable display, a game sphere can be accurately guided to the field which corresponded according to the display result.

[0356] It becomes that it is possible in it being specially supposed by the field detection means that detection is invalid when it is in the game [by which a game sphere should be specially guided to a field since it considers as the composition confirmed in the period when detection usually according to a field detection means specially by invention according to claim 7 is repealed in, and the guidance operation means is performing guidance operation of ** a 1st at least] state which is not, and preventing generating of an unjust right. Moreover, since detection of a field detection means will be specially confirmed when it is in the game state where a game sphere may be specially guided to a field at least, it becomes possible to prevent checking generating of a just right.

[0357] On condition that the game sphere was detected by the operation detection

means, while starting adjustable presenting of identification information in invention according to claim 8 It can prevent that a series of processings will newly be started by the time a series of processings based on the operation detection means having detected the game sphere are completed, since the period which is performing the adjustable display at least, and the period when the guidance operation means is performing guidance operation repeated detection by the operation detection means.

[0358] On condition that the game sphere was detected by the operation detection means, while starting adjustable presenting of identification information in invention according to claim 9 It can prevent that a game sphere will be led to an operation detection means by the time a series of processings based on the operation detection means having detected the game sphere are completed, since the period which is performing the adjustable display at least, and the period when the guidance operation means is performing guidance operation prepared the covered member by which a game sphere is made not to be led to an operating space.

[0359] In invention according to claim 10, since it considers as the composition judge that is unusual when there is no detection of a field detection means specially in spite of having displayed the specific display result on the adjustable display, failure of a field detection means can be judged specially.

[0360] In invention according to claim 11, since an eccentric detection means by which the game sphere usually guided to the field is detectable is established, it can grasp whether the game sphere was discharged certainly.

[0361] While game control means output the production start command for making the auxiliary production performed corresponding to adjustable presenting of the identification information in an adjustable display start to production control means in invention according to claim 12 using the electrical part for production Production control means are able to control the electrical part for production based on the inputted production start command, and it sets in the right generating state. Since game control means are considered as the composition which does not output the production start command corresponding to the adjustable display concerned to production control means even if they are the cases where adjustable presenting of identification information is performed in an adjustable display It can prevent that control based on a production start command will be performed in production control means in a right generating state.

[0362] While game control means output the production start command for making the auxiliary production performed corresponding to adjustable presenting of the identification information in an adjustable display start to production control means

in invention according to claim 13 using the electrical part for production It is possible in production control means controlling the electrical part for production based on the inputted production start command, and in a right generating state, production control means can prevent that control based on a production start command will be performed in production control means, when it is in a right generating state since auxiliary production is not started based on the production start command concerned, even if a production start command is inputted.

[Translation done.]

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the front view showing the example which saw the pachinko game machine from the transverse plane.

[Drawing 2] It is the front view showing the example which saw the game board of a pachinko game machine from the transverse plane.

[Drawing 3] It is the front view showing the example which saw ***** equipment, a guide, and distribution equipment from the transverse plane.

[Drawing 4] It is the front view showing other examples of distribution equipment.

[Drawing 5] It is the front view showing the example of further others of distribution equipment.

[Drawing 6] It is explanatory drawing showing the example of other structures for preventing continuation winning a prize on V winning-a-prize switch.

[Drawing 7] It is the rear view showing the example of the structure of the rear face of a pachinko game machine.

[Drawing 8] It is the block diagram showing an example of the circuitry in the main substrate.

[Drawing 9] It is the block diagram showing an example of the composition of a display-control circuit.

[Drawing 10] It is the block diagram showing the circuitry in a ramp-control substrate.

[Drawing 11] It is the block diagram showing the circuitry in a sound control board.

[Drawing 12] It is the block diagram showing the circuitry in a power supply substrate.

[Drawing 13] It is the block diagram showing the example of 1 composition of the circumference of CPU in the main substrate.

[Drawing 14] It is the flow chart which shows the main processing which CPU in the main substrate performs.

[Drawing 15] It is explanatory drawing showing an example of the relation of whether to perform game state restoration processing with a backup flag.

[Drawing 16] It is the flow chart which shows timer-interruption processing for 2ms.

[Drawing 17] It is explanatory drawing showing each random number.

[Drawing 18] It is the flow chart which shows the processing which determines the processing and the change pattern which determine the halt pattern of an adjustable display.

[Drawing 19] It is the flow chart which shows processing of a hit judging.

[Drawing 20] It is the flow chart which shows pattern process processing.

[Drawing 21] It is explanatory drawing showing the example of the right-and-left pattern displayed on an adjustable display.

[Drawing 22] It is explanatory drawing showing the example of the background

pattern displayed on an adjustable display.

[Drawing 23] It is explanatory drawing showing the example of the character displayed on an adjustable display.

[Drawing 24] It is explanatory drawing showing the signal line of a display-control command.

[Drawing 25] It is explanatory drawing showing an example of the command form of control command.

[Drawing 26] It is the timing chart showing the relation of the 8-bit control signal and INT signal which constitute control command.

[Drawing 27] It is explanatory drawing showing an example of the content of a display-control command.

[Drawing 28] It is explanatory drawing showing an example of the content of a ramp-control command.

[Drawing 29] It is explanatory drawing showing an example of the content of sound control command.

[Drawing 30] It is explanatory drawing showing the upset condition which constitutes each change pattern of a pattern.

[Drawing 31] It is the timing chart showing an example of change of the pattern at the time of a blank.

[Drawing 32] It is the timing chart showing an example of change of a pattern.

[Drawing 33] It is the timing chart showing an example of change of a pattern.

[Drawing 34] It is explanatory drawing showing the example of 1 composition of a command transmitting table.

[Drawing 35] It is explanatory drawing showing the example of 1 composition and other examples of composition of the command data 2.

[Drawing 36] It is explanatory drawing showing the example of 1 composition of INT data.

[Drawing 37] It is explanatory drawing showing the example of 1 composition of a command transmitting table.

[Drawing 38] It is the flow chart which shows the example of processing of viewing-command control processing.

[Drawing 39] It is the flow chart which shows a command transmitting routine.

[Drawing 40] It is the flow chart which shows mask impossible interrupt processing in game control means.

[Drawing 41] It is the flow chart which shows mask impossible interrupt processing in game control means.

[Drawing 42] It is the flow chart which shows mask impossible interrupt processing in game control means.

[Drawing 43] It is the flow chart which shows game state restoration processing.

[Drawing 44] It is the flow chart which shows the main processing which CPU for display controls performs.

[Drawing 45] It is the flow chart which shows timer-interruption processing.

- [Drawing 46] It is explanatory drawing showing the composition of a command receive buffer.
- [Drawing 47] It is the flow chart which shows command receive-interrupt processing.
- [Drawing 48] It is the flow chart which shows command analysis processing.
- [Drawing 49] It is explanatory drawing showing the random number for a display.
- [Drawing 50] It is the flow chart which shows display-control process processing.
- [Drawing 51] It is the flow chart which shows the waiting processing for display-control command reception of display-control process processing.
- [Drawing 52] It is explanatory drawing showing the example in the state where the change pattern command etc. was set as the command transmitting table.
- [Drawing 53] It is the flow chart which shows complete diagram handle change start processing of display-control process processing.
- [Drawing 54] It is the flow chart which shows processing during pattern change of display-control process processing.
- [Drawing 55] It is the flow chart which shows the waiting processing for a complete diagram handle halt of display-control process processing.
- [Drawing 56] It is the flow chart which shows display processing in a right generating state of display-control process processing.
- [Drawing 57] It is the timing chart showing the processing which CPU for display controls at the time of receiving a change pattern command in a right generating state performs.
- [Drawing 58] It is the flow chart which shows the main processing which CPU for ramp control performs.
- [Drawing 59] It is the flow chart which shows the timer-interruption processing which CPU for ramp control performs.
- [Drawing 60] It is explanatory drawing showing the lamp data in the address map of ROM carried in the ramp-control substrate.
- [Drawing 61] It is the timing chart showing the processing which CPU for ramp control at the time of receiving a change pattern command in a right generating state performs.
- [Drawing 62] It is the flow chart which shows the main processing which CPU for sound control performs.
- [Drawing 63] It is the flow chart which shows the timer-interruption processing which CPU for sound control performs.
- [Drawing 64] It is explanatory drawing showing the voice data in the address map of ROM carried in the sound control board.
- [Drawing 65] It is the timing chart showing the processing which CPU for sound control at the time of receiving a change pattern command in a right generating state performs.
- [Drawing 66] It is the timing chart showing other examples of the processing which CPU for display controls at the time of receiving a change pattern command in a right generating state performs.

[Drawing 67] It is explanatory drawing showing the example of the display state of a Light Emitting Diode drop.

[Drawing 68] It is the timing chart showing other examples of the processing which CPU for ramp control at the time of receiving a change pattern command in a right generating state performs.

[Drawing 69] It is the timing chart showing other examples of the processing which CPU for sound control at the time of receiving a change pattern command in a right generating state performs.

[Drawing 70] It is explanatory drawing showing the example of the state of the voice outputted.

[Drawing 71] It is the flow chart which shows the example of the switch processing in the gestalt of other operations.

[Drawing 72] It is the flow chart which shows an example of the command transmitting table set up processing in the gestalt of other operations.

[Drawing 73] It is the flow chart which shows other examples of the command analysis processing which the ramp-control means in the gestalt of other operations performs.

[Drawing 74] It is the flow chart which shows other examples of the command analysis processing which the sound control means in the gestalt of other operations perform.

[Drawing 75] It is the front view showing the example which saw the game board of the pachinko game machine in the gestalt of other operations from the transverse plane.

[Drawing 76] It is the front view showing the example which saw the right generator in the gestalt of other operations from the transverse plane.

[Description of Notations]

1 Pachinko Game Machine

9 Adjustable Display

310 The Main Substrate

314 CPU

350 Ramp-Control Substrate

351 CPU for Ramp Control

700 Sound Control Board

701 CPU for Sound Control

800 Display-Control Substrate

801 CPU for Display Controls

[Translation done.]

* NOTICES *

Japan Patent Office is not responsible for any damages caused by the use of this translation.

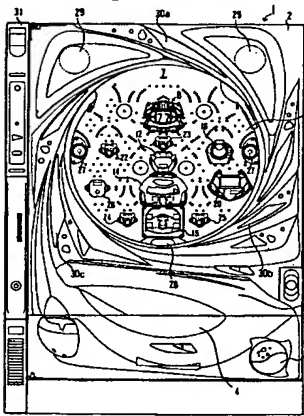
1. This document has been translated by computer. So the translation may not reflect the original precisely.

2. **** shows the word which can not be translated.

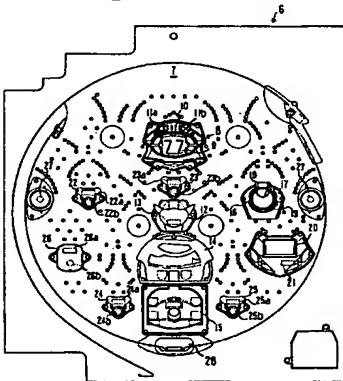
3. In the drawings, any words are not translated.

DRAWINGS

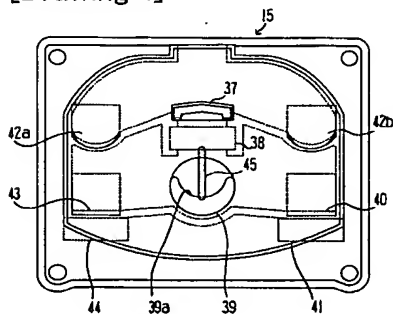
[Drawing 1]



[Drawing 2]



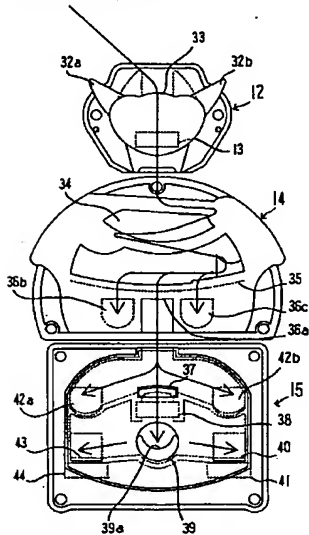
[Drawing 4]



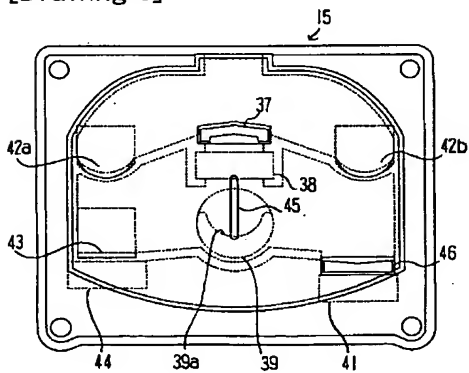
[Drawing 15]

バックアップ フラグの値	5 5 H	5 5 H 以外
	5 5 H	5 5 H 以外
チェック結果	正常	初期化
	異常	初期化

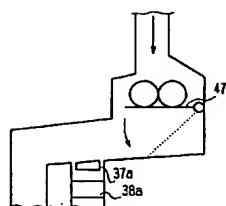
[Drawing 3]



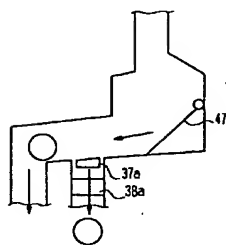
[Drawing 5]



[Drawing 6]



(A)

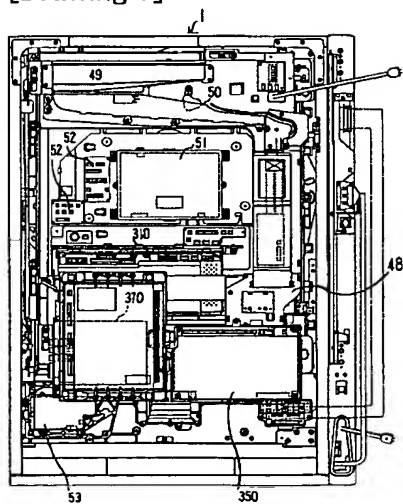


(B)

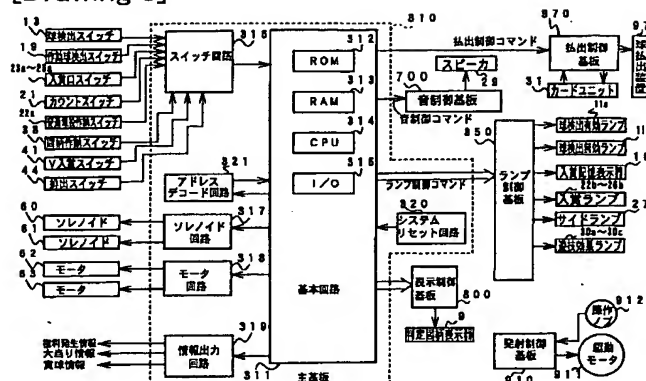
[Drawing 21]

番号左図柄	番号右図柄
1 0	1 0
2 1	2 1
3 2	3 2
4 3	4 3
5 4	5 4
6 5	6 5
7 6	7 6
8 7	8 7
9 8	9 8
10 9	10 9

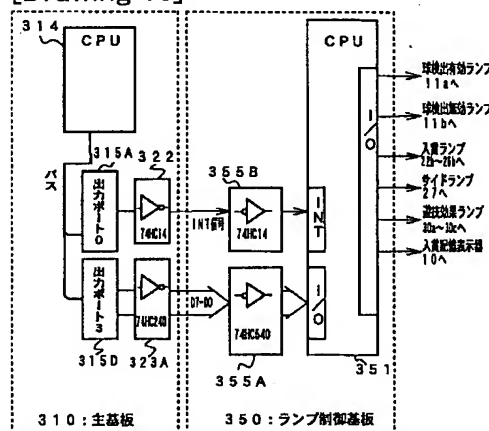
[Drawing 7]



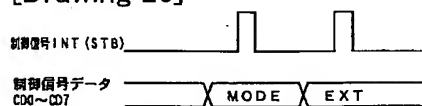
[Drawing 8]



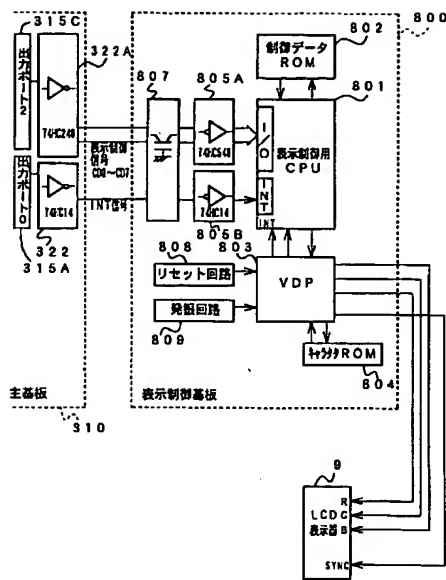
[Drawing 10]



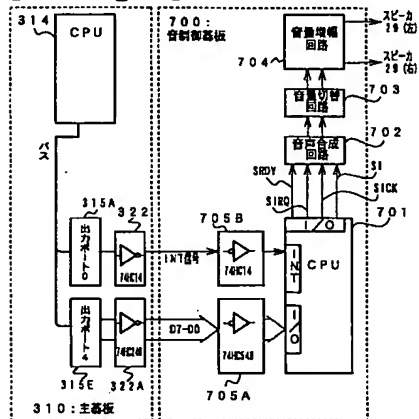
[Drawing 26]



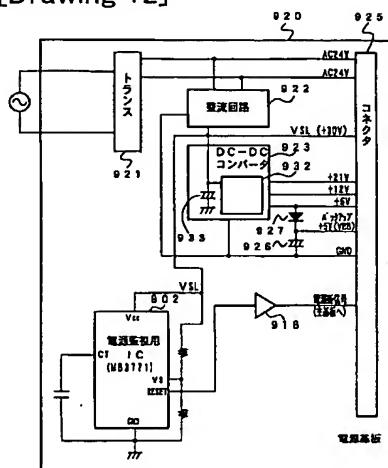
[Drawing 9]



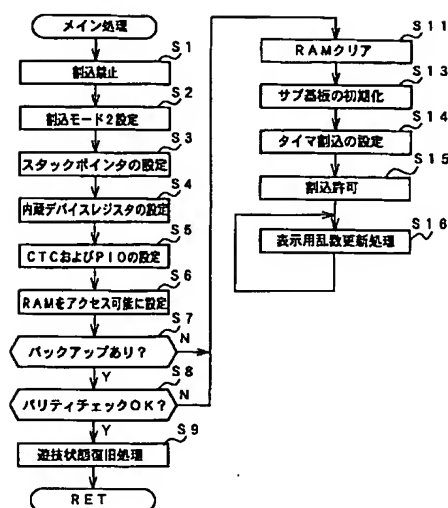
[Drawing 11]



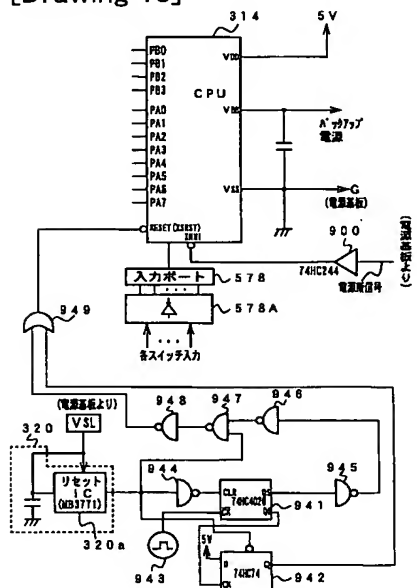
[Drawing 12]



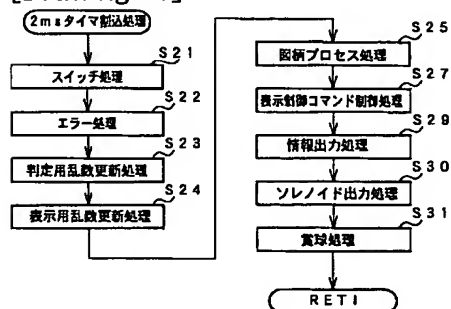
[Drawing 14]



[Drawing 13]



[Drawing 16]

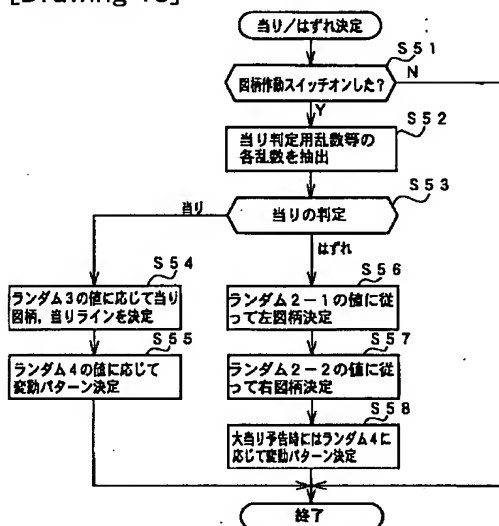


[Drawing 17]

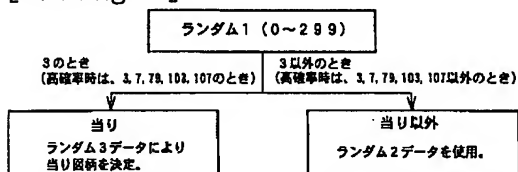
ランダム	範囲	用途	加算
1	0~299	当り判定用	0.002秒毎に1ずつ加算
2-1	左0~9	はずれ図柄決定用	0.002秒毎および割り込み処理 余り時間に1ずつ加算
2-2	右0~9		ランダム2-1の桁上げごとに 1ずつ加算
3	0~49	当り図柄決定用	0.002秒毎に1ずつ加算
4	0~xx	変動パターン決定用	0.002秒毎および割り込み処理 余り時間に1ずつ加算

(xx=変動パターン種類-1)

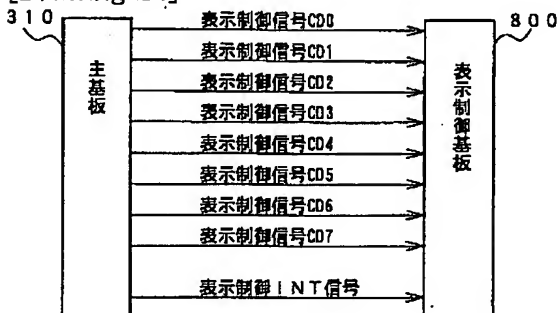
[Drawing 18]



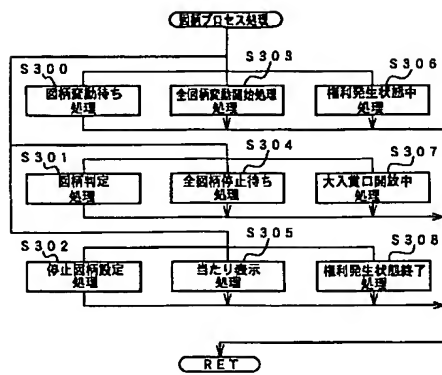
[Drawing 19]



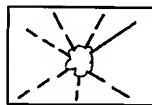
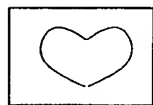
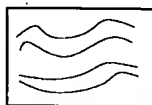
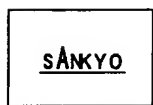
[Drawing 24]



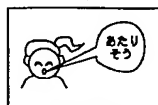
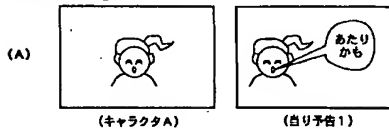
[Drawing 20]



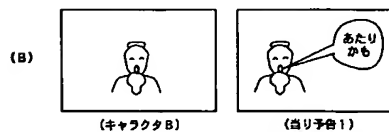
[Drawing 22]

(原景の中)
(A)(閃光)
(B)(オーラ)
(C)(縋)
(D)(デモンストレーション)
(E)

[Drawing 23]



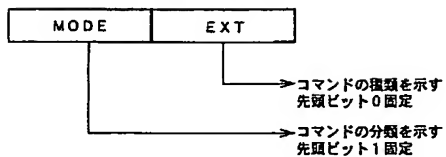
(当り予告2)



(当り予告2)

[Drawing 25]

(制御コマンド：制御信号データ)



[Drawing 29]

MODE	EXT	名称	内容
B 0	X X	変動中音指定	特別図柄変動中の音声を指定
9 0	0 0	初期化音指定	電源投入時の初期化時音声を指定
9 1	0 1	権利発生状態開始	権利発生状態フラグのセットを指定
9 1	0 2	権利発生状態終了	権利発生状態フラグのリセットを指定
B 2	0 0	大当り開始音指定	大当り開始時の音声を指定
B 4	0 1	入賞口開放前音指定	特別可変入賞口開放前の音声を指定
B 4	0 2	入賞口開放中音指定	特別可変入賞口開放中の音声を指定
B 6	0 1	大当り終了音指定	大当り終了時の音声を指定

[Drawing 49]

用途	範囲
当り予告用	0～1

[Drawing 27]

MODE	EXT	名称	内容
B 0	0 0	変動パターン指定#1	図柄変動パターン1の指定
	⋮	⋮	⋮
B 0	X X	変動パターン指定XX-1	図柄変動パターン(XX-1)の指定
B F	0 0	図柄電源投入時指定	図柄の初期化指定
9 1	0 1	権利発生状態開始	権利発生状態フラグのセットを指定
9 1	0 2	権利発生状態終了	権利発生状態フラグのリセットを指定
9 2	X X	左図柄指定	図柄左の停止図柄を指定
9 4	X X	右図柄指定	図柄右の停止図柄を指定
A 0	0 0	図柄停止	図柄の停止指示
B 1	X X	特別可変入賞口開放時表示	X Xで示す回数目の特別可変入賞口開放中表示指定
B 2	0 0	大当り表示開始時	大当り開始時画面の表示指定
B 2	X X	特別可変入賞口開放前表示	特別可変入賞口開放前の表示指定 (XX=01以上)
B 4	0 0	当り図柄表示	当り図柄の表示指定
B 5	0 0	大当り終了表示	大当り終了時画面の表示指定
B 7	0 0	権利発生状態表示	権利発生状態開始画面の表示指定
B 9	0 0	権利発生状態終了表示	権利発生状態終了画面の表示指定
C 0	0 0	客待ちデモ表示	客待ちデモンストレーション時の表示指定
C 1	0 0	特別図柄停電復旧表示	停電復旧時の表示 (特別図柄に関して)

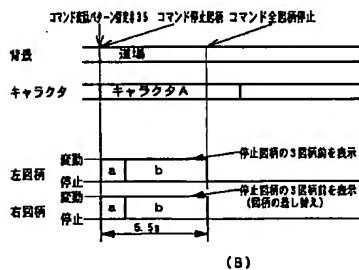
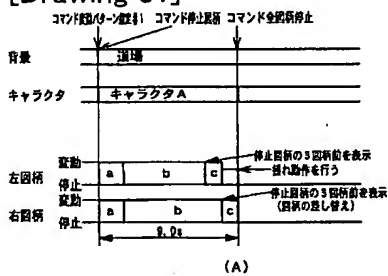
[Drawing 28]

MODE	EXT	名称	内容
B 0	X X	図柄変動中ランプ指定	図柄変動中の飾りランプの表示を指定
9 0	0 0	初期化ランプ指定	電源投入時の初期化時音声を指定
9 0	0 1	客待ちランプ指定	客待ちデモ中の飾りランプの表示を指定
9 1	0 1	権利発生状態開始	権利発生状態フラグのセットを指定
9 1	0 2	権利発生状態終了	権利発生状態フラグのリセットを指定
B 2	0 0	当たり開始ランプ指定	当たり開始時の飾りランプの表示を指定
B 2	0 1	当たり時ランプ指定	当たり開始時の遊技状態ランプの表示を指定
B 4	0 1	開放前ランプ指定	特別可変入賞口開放前の飾りランプの表示を指定
B 4	0 2	開放中ランプ指定	特別可変入賞口開放中の飾りランプの表示を指定
B 6	0 1	当たり終了ランプ指定	当たり終了時の飾りランプの表示を指定
B 6	0 2	当たり終了時ランプ指定	当たり終了時の遊技状態ランプの表示を指定
B 7	0 1	権利発生状態開始時ランプ指定	権利発生状態開始時のランプの表示を指定
B 8	X X	権利発生状態中ランプ指定	権利発生状態中のランプの表示を指定
B 9	0 1	権利発生状態終了時ランプ指定	権利発生状態終了時のランプの表示を指定
C 0	0 1	確率状態 (高確率)	高確率状態に応じた遊技状態ランプの表示を指定
C 0	0 2	確率状態 (低確率)	低確率状態に応じた遊技状態ランプの表示を指定
E 1	X X	入賞記憶表示ランプ指定	入賞記憶表示ランプの表示値を指定

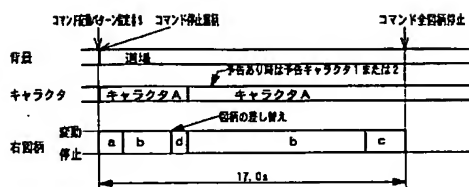
[Drawing 30]

種別	パターン
a	徐々に速くなる (加速)
b	一定速運動
c	徐々に遅くなって停止 (減速後停止)
d	徐々に遅くなってその後一定速運動 (減速後一定速運動)
e	1コマ逆送り
f	高速運動
g	コマ送り運動
h	0.9回順逆運動して0.9回順運動

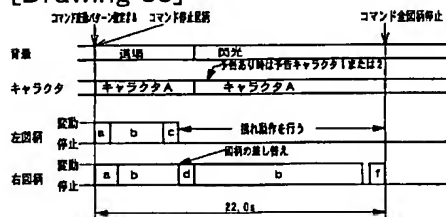
[Drawing 31]



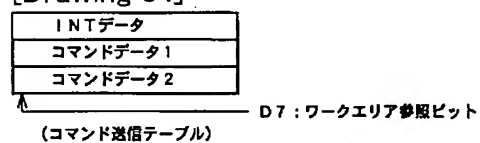
[Drawing 32]



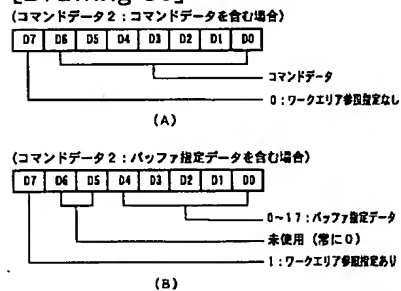
[Drawing 33]



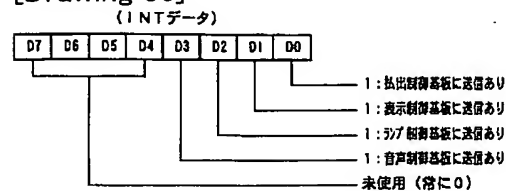
[Drawing 34]



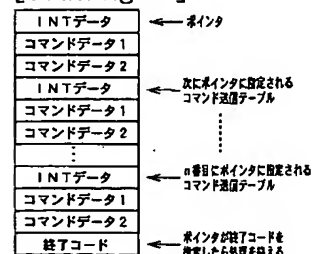
[Drawing 35]



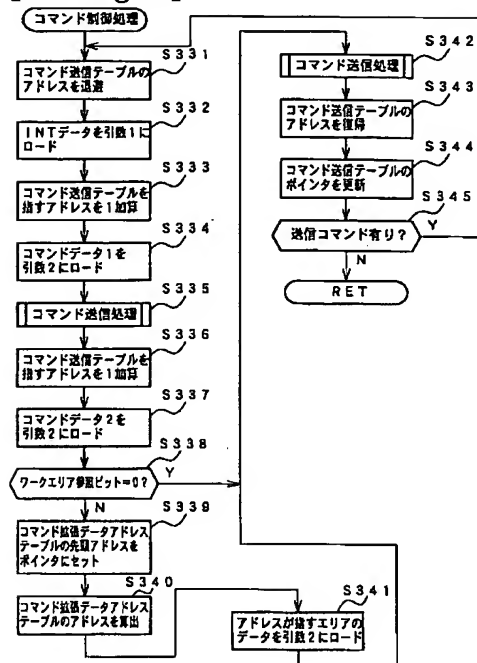
[Drawing 36]



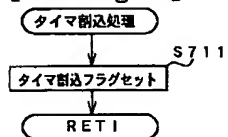
[Drawing 37]



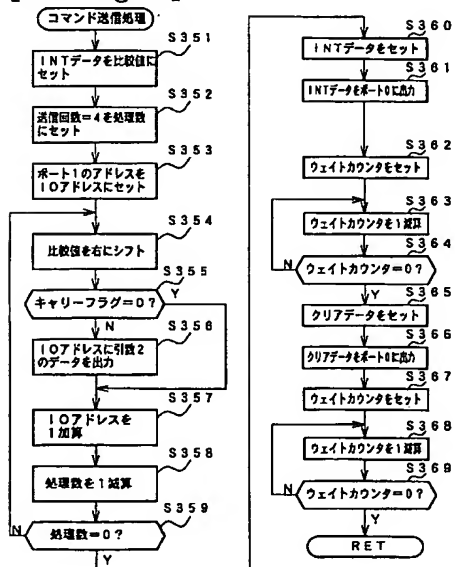
[Drawing 38]



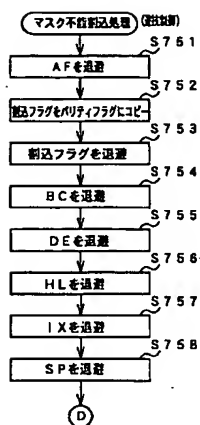
[Drawing 45]



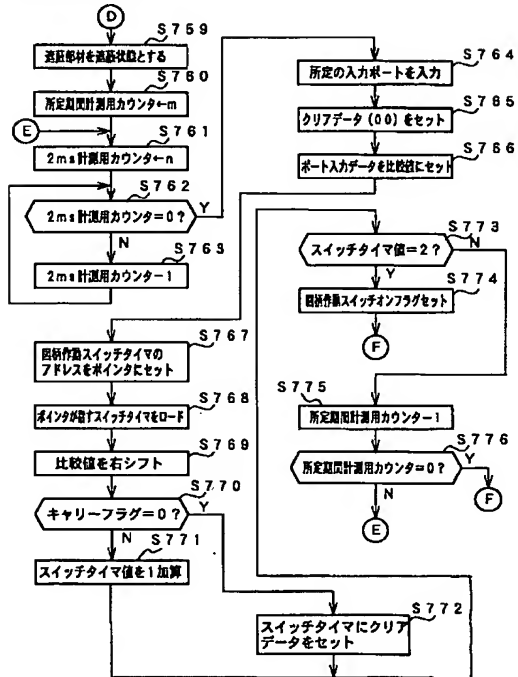
[Drawing 39]



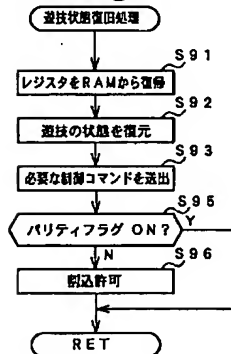
[Drawing 40]



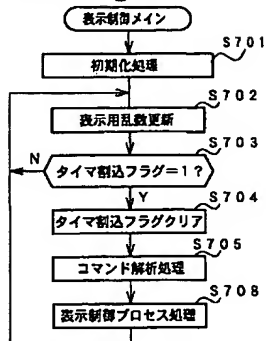
[Drawing 41]



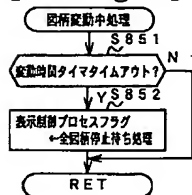
[Drawing 43]



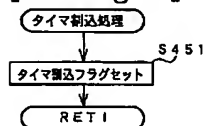
[Drawing 44]



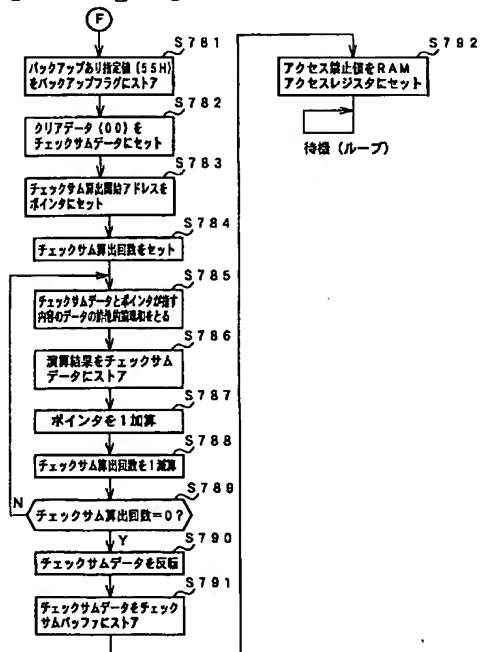
[Drawing 54]



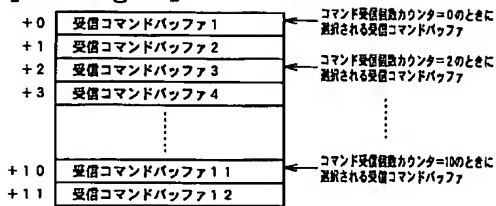
[Drawing 59]



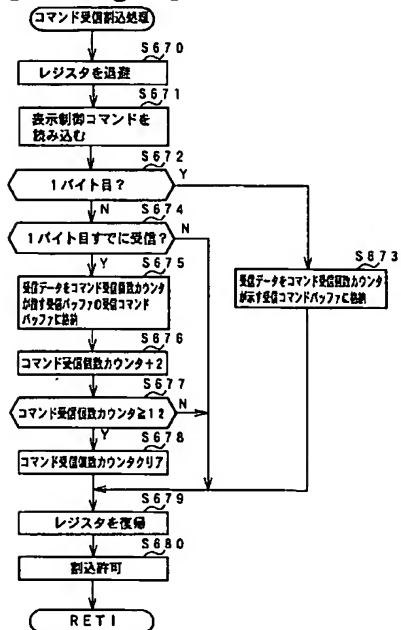
[Drawing 42]



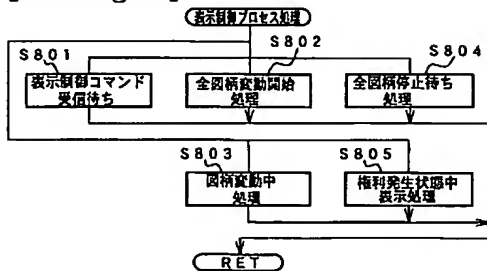
[Drawing 46]



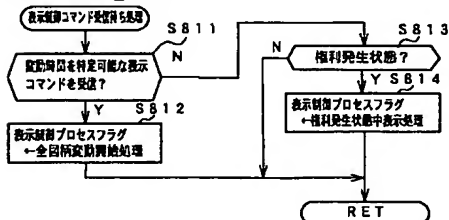
[Drawing 47]



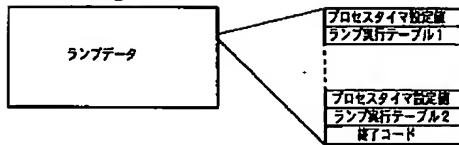
[Drawing 50]



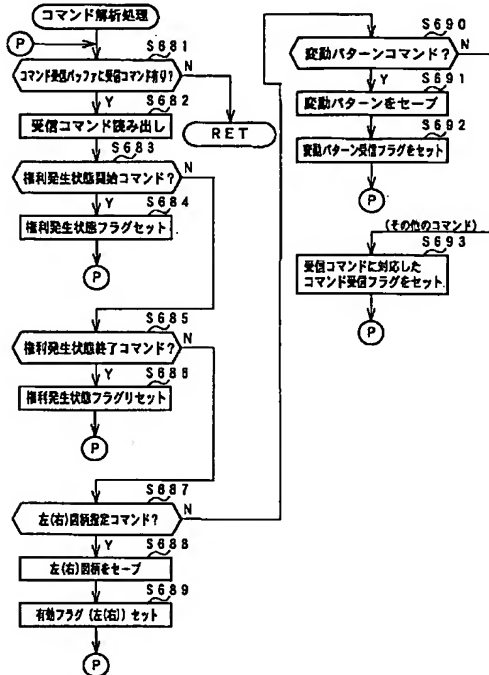
[Drawing 51]



[Drawing 60]



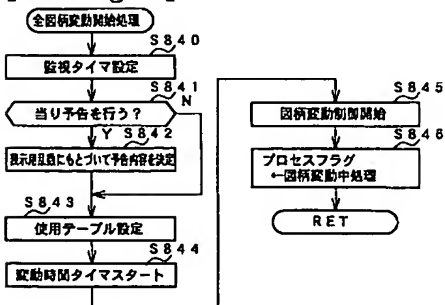
[Drawing 48]



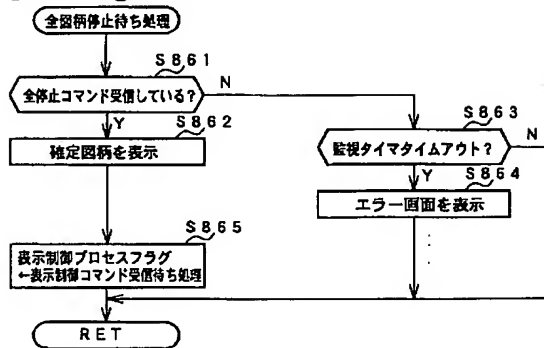
[Drawing 52]

INTデータ	表示制御信号出力INT=02 (H)	
コマンドデータ1	図柄変動パターンコマンド=80 (H)	(※:コマンド送信テーブル)
コマンドデータ2	ワークエリア参照指定あり+図柄変動パターン=80 (H)	
INTデータ	表示制御信号出力INT=02 (H)	
コマンドデータ1	図柄左指定コマンド=92 (H)	(※:コマンド送信テーブル)
コマンドデータ2	ワークエリア参照指定あり+図柄左指定=81 (H)	
INTデータ	表示制御信号出力INT=02 (H)	
コマンドデータ1	図柄右指定コマンド=94 (H)	(※:コマンド送信テーブル)
コマンドデータ2	ワークエリア参照指定あり+図柄右指定=83 (H)	
終了コード	00 (H)	

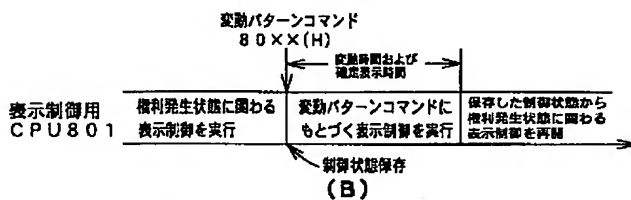
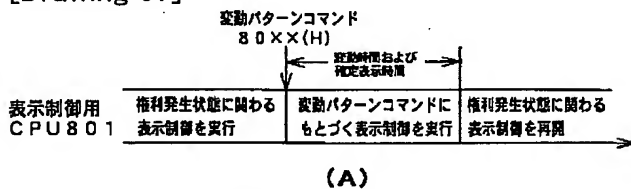
[Drawing 53]



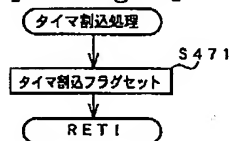
[Drawing 55]



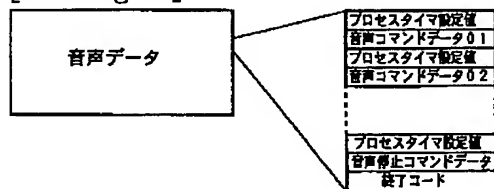
[Drawing 57]



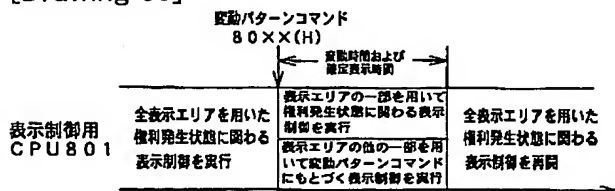
[Drawing 63]



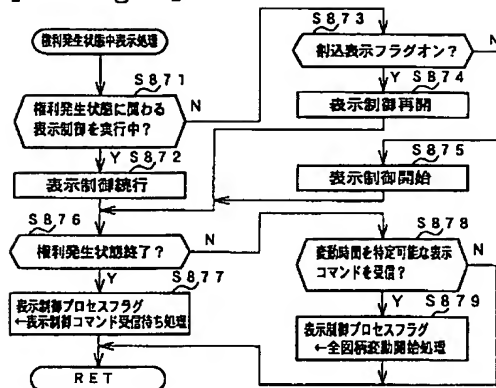
[Drawing 64]



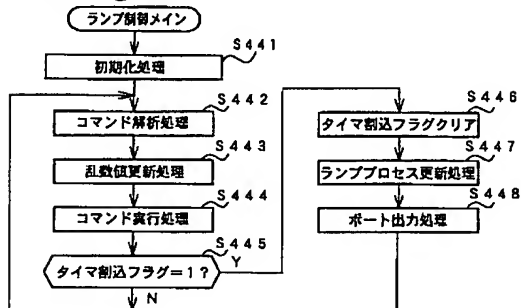
[Drawing 66]



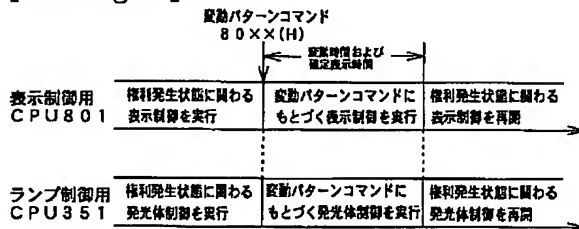
[Drawing 56]



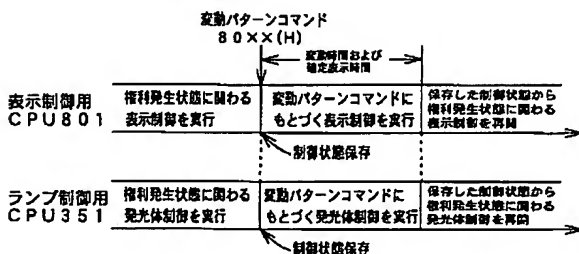
[Drawing 58]



[Drawing 61]

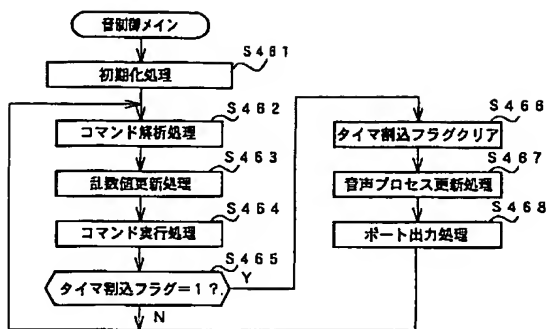


(A)

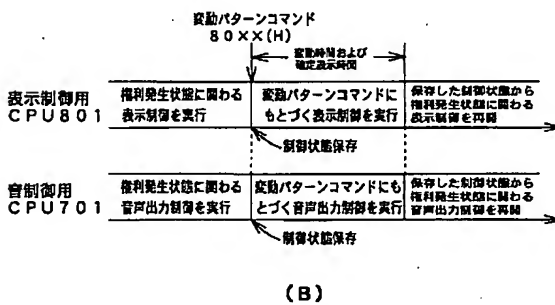
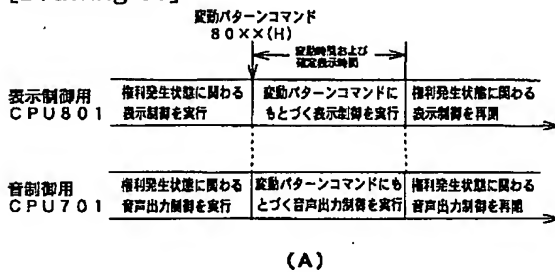


(B)

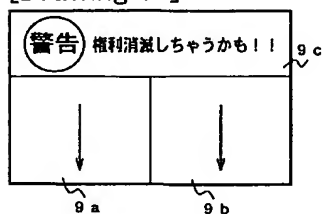
[Drawing 62]



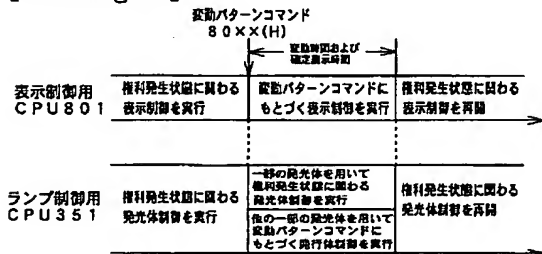
[Drawing 65]



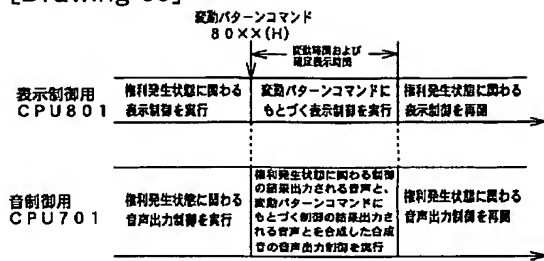
[Drawing 67]



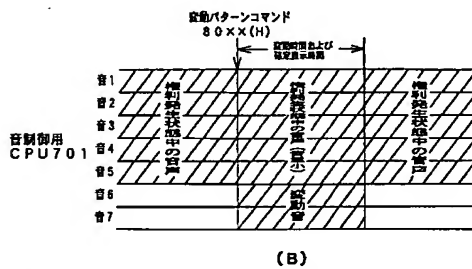
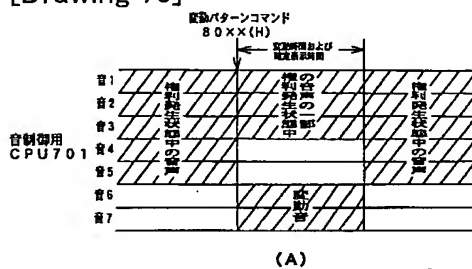
[Drawing 68]



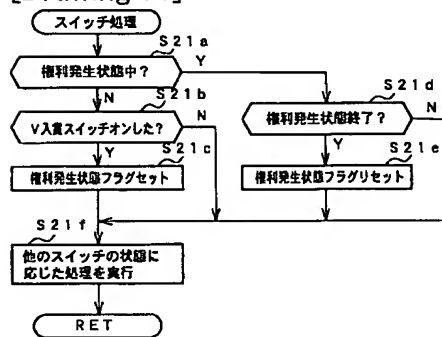
[Drawing 69]



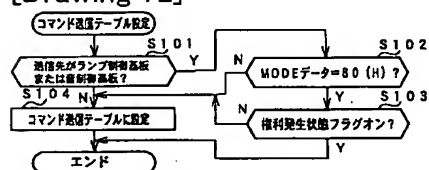
[Drawing 70]



[Drawing 71]



[Drawing 72]



[Drawing 73]

